

CORRECTED
DIRECT TESTIMONY
of

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Finance Department
Financial Analysis Division
Illinois Commerce Commission

Consumers Illinois Water Company
Proposed General Increase In Water Rates

Docket No. 03-0403

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Witness Identification

Q. Please state your name and business address.

A. My name is Sheena Kight. My business address is 527 East Capitol Avenue,
Springfield, IL 62701.

Q. By whom are you employed and in what capacity?

A. I am employed by the Illinois Commerce Commission (“Commission”) as a
Financial Analyst in the Finance Department of the Financial Analysis Division.

Q. Please describe your qualifications and background.

A. In May of 1998, I received a Bachelor of Business degree in Finance and
Marketing from Western Illinois University in Macomb, Illinois. I earned a Master
of Business Administration degree, with a concentration in Finance, also at
Western Illinois University in May 2001. I have been employed by the
Commission in my present position since January of 2001.

Q. Please state the purpose of your testimony in this proceeding.

A. The purpose of my testimony is to present the overall cost of capital and to
recommend a fair rate of return on rate base for Consumers Illinois Water

Company ("Company" or "CIWC"). I will also respond to the direct testimony of CIWC witness Pauline M. Ahern.

Cost Of Capital

Q. Please summarize your cost of capital findings.

A. The overall cost of capital for CIWC is 8.87%, as shown on Schedule 3.01.

Q. Why must one determine an overall cost of capital for a public utility?

A. Under the traditional regulatory model, the proper balance of ratepayer and shareholder interests occurs when the Commission authorizes a public utility a rate of return on its rate base equal to its overall cost of capital. If the authorized rate of return on rate base exceeds the overall cost of capital, then ratepayers bear the burden of excessive prices. Conversely, if the authorized rate of return on rate base is lower than the overall cost of capital, then the utility may be unable to raise capital at a reasonable cost. Ultimately, the utility's inability to raise sufficient capital would impair service quality. Therefore, ratepayer interests are served best when the authorized rate of return on rate base equals the overall cost of capital.

In authorizing a rate of return on rate base equal to the overall cost of capital, all costs of service are assumed reasonable and accurately measured. If

unreasonable costs continue to be incurred, or if any reasonable cost of service component is measured inaccurately, then the allowed rate of return on rate base will not balance ratepayer and investor interests.

Q. Please define the overall cost of capital for a public utility.

A. The overall cost of capital for a public utility equals the sum of the costs of the components of the capital structure (i.e., debt, preferred and preference stock, and common equity) after weighting each by its proportion to total capital.

Capital Structure

Q. What capital structure does the Company propose for determining the rate of return on rate base?

A. The Company proposes determining the rate of return on rate base on the basis of a forecasted average 2004 capital structure. The Company's proposed capital structure appears on Schedule 3.01.

Q. What capital structure do you recommend for setting rates in this proceeding?

A. My proposed capital structure is shown on Schedule 3.01. I also used a forecasted average 2004 capital structure.

Q. What adjustments did you make to the Company's proposed balance of short-term debt?

A. I adjusted the monthly balance of short-term debt to the portion supporting CWIP. To calculate the balance of short-term debt, I first calculated the monthly ending net balance of short-term debt outstanding each month. The net balance of short-term debt is the greater of a) the monthly ending gross balance of short-term debt outstanding minus the corresponding monthly ending balance of construction-work-in-progress ("CWIP") accruing an allowance for funds used during construction ("AFUDC") or b) CWIP accruing AFUDC times the ratio of short-term debt to total CWIP. That adjustment recognizes that the Commission's formula for calculating AFUDC assumes short-term debt is the first source of funds financing CWIP and addresses the concern the Commission raised about double-counting short-term debt balances in a previous Order.¹ Next, I calculated twelve monthly averages from the monthly ending net balances of short-term debt. Finally, I averaged the twelve monthly average net balances of short-term debt for January 2004 through December 2004, which is consistent with the other components of the Company's proposed capital structure. Schedule 3.02 presents the calculation of the average adjusted balance of short-term debt.

Q. Did you make adjustments to the Company's proposed balance of long-term debt?

73 A. No. However, I made a few minor adjustments to the long-term debt schedule to
74 reconcile it with Company responses to Commission Staff ("Staff") data requests
75 and the Company's annual filing to the Commission. The date issued for long-
76 term debt issues Series N and Series P was changed from 3/15/95 and 7/15/95
77 to 3/15/91 and 7/24/92, respectively. I also added an issue date and maturity
78 date for Series V. The long-term debt schedule is presented on Schedule 3.03.

79 **Q. Did you make any adjustments to the Company's proposed balance of**
80 **preferred stock?**

81 A. No. The average balance of preferred stock is presented on Schedule 3.04.

82 **Q. Did you make adjustments to the Company's proposed balance of**
83 **common equity?**

84 A. No. I did not make any adjustment to the Company's proposed balance of
85 common equity.

86 **Q. Does capital structure affect the overall cost of capital?**

87 A. Yes. Capital structure will affect the value of a firm and, therefore, its cost of
88 capital, to the extent it affects the expected level of cash flows that accrue to third
89 parties (i.e., other than debt and stock holders). Employing debt as a source of

¹ Order, Docket No. 95-0076, December 20, 1995, p. 51.

capital reduces a company's income taxes,² thereby reducing the cost of capital; however, as reliance on debt as a source of capital increases, so does the probability of bankruptcy. As bankruptcy becomes more probable, expected payments to attorneys, trustees, accountants and other third parties increase. Simultaneously, the expected value of the income tax shield provided by debt financing declines. Beyond a certain point, a growing dependence on debt as a source of funds increases the overall cost of capital. Therefore, the Commission should not determine the overall rate of return from a utility's actual capital structure if it determines that capital structure adversely affects the overall cost of capital.

An optimal capital structure would minimize the cost of capital and maintain a utility's financial integrity. Unfortunately, determining whether a capital structure is optimal remains problematic because (1) the cost of capital is a continuous function of the capital structure, rendering its precise measurement along each segment of the range of possible capital structures problematic; (2) the optimal capital structure is a function of operating risk, which is dynamic; and (3) the relative costs of the different types of capital vary with dynamic market conditions. Consequently, one should determine whether the capital structure is consistent with the financial strength necessary to access the capital markets

² The tax advantage debt has over equity at the corporate level is partially offset at the individual investor level. Debt investors receive returns largely in the form of current income (i.e., interest). In contrast, equity investors receive returns in the form of both current income (i.e., dividends) and capital appreciation (i.e., capital gains). Taxes on corporate dividends and capital gains are lower than taxes on corporate interest income because corporate dividend and capital gains tax rates are lower and taxes on capital gains are deferred until realized.

under most, if not all, conditions, and if so, whether the cost of that financial strength is reasonable.

Towards that end, I compared the Company's average 2004 capital structure to industry standards. Standard & Poor's ("S&P") categorizes debt securities on the basis of the risk that a company will default on its interest or principal payment obligations. The resulting credit rating reflects both the operating and financial risks of a utility.³ The mean total debt ratio of water utilities that have an S&P 'A' credit rating equals 55.13%.⁴ The mean common equity ratio for S&P A-rated water utilities equals 44.00%. The above ratios are shown in Table 1 below for comparative purposes.

**Table 1:
Capital Structure Ratios**

	A-rated Water Utilities		S&P Benchmark for an 'A' Credit Rating and Business Profile of 3	CIWC Average 2004
	Mean	Standard Deviation	Range	
Total Debt Ratio	55.13%	2.35%	47.5% - 53.0%	48.59%
Equity Ratio	44.00%	2.62%		51.06%

CIWC's average 2004, total debt and equity ratios are reasonably close to the mean total debt and equity ratios for S&P A-rated water utilities. According to S&P, an obligor rated 'A' has a strong capacity to meet its financial commitments

³ *Standard & Poor's Utility Financial Statistics*, June 1999, p. 3; Standard & Poor's Utilities Rating Service: Industry Commentary, May 20, 1996, p. 1.

⁴ *S&P Utility Compustat*.

but to a lesser degree than higher-rated obligors.⁵ The above suggests that the average 2004 capital structure for CIWC as presented by Staff on Schedule 3.01 is commensurate with a strong but not excessive degree of financial strength.

Q. S&P currently does not rate CIWC. Why did you compare CIWC's capital ratios to water utilities with an A credit rating?

A. S&P publishes targets for the following four financial ratios (collectively, the "Benchmark Ratios") that it uses in its analysis of investor-owned utilities: (1) funds from operations ("FFO") to total debt; (2) FFO interest coverage; (3) pre-tax interest coverage; and (4) total debt to total capital.⁶ The Benchmark Ratios measure financial risk. The financial targets vary with the business profile score. The S&P published targets for utilities with business profile scores of 3 indicate that CIWC's financial strength is consistent with an A+ corporate credit rating. Table 2 presents CIWC's and Pennsylvania Suburban Water Company's ("PSW"), both wholly owned subsidiaries of Philadelphia Suburban Corporation ("PSC"),⁷ financial ratios for the 2000-2002 period.

⁵ *Standard & Poor's Utility Financial Statistics*, June 1999, p. 4.

⁶ Standard & Poor's, "Utility Financial Targets are Revised," June 18, 1999.

⁷ Standard & Poor's Ratings Direct, "Research: Pennsylvania Suburban Water Co.," September 23, 2003, p. 2. "The ratings on Pennsylvania Suburban reflect the consolidated credit quality of the parent, Philadelphia Suburban Corp. (PSC)... Philadelphia Suburban has a financial profile that is currently adequate for the rating category..." See attachment A.

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**Table 2:
S&P Utility Benchmark Credit Ratio Analysis**

	<u>CIWC</u>	<u>PSW</u>	<u>S&P Target Range</u>	<u>S&P Target Range</u>
Financial Ratio	3-year average	3-year average ⁸	AA-rated utilities with a business profile score of 3	A-rated utilities with a business profile score of 3
Adj. FFO to Avg.Total Debt	21.44%	17.60%	26.0% – 31.5%	20.0% – 26.0%
Adj. FFO Interest Coverage	4.0x	3.6x	3.9x – 4.5x	3.1x – 3.9x
Adj. EBIT Interest Coverage	2.9x	3.5x	3.4x – 4.0x	2.8x – 3.4x
Adj.Total Debt to Capital	51.8%	54.8%	42.0% – 47.5%	47.5% – 53.0%

139 The ratios in Table 2 indicate that CIWC's financial strength is as strong if not
140 stronger than PSW, which Standard and Poor's rates A+.⁹

141 **Q. Why did you compare CIWC's Benchmark Ratio values to the ranges S&P**
142 **established for the business profile score of 3?**

143 A. A firm's market-required return on common equity is a function of its operating
144 and financial risks. S&P business profile scores reflect the operating risk of a
145 utility. S&P focuses on industry characteristics as well as the company's

⁸ Standard & Poor's Ratings Direct, "Research: Pennsylvania Suburban Water Co.," September 23, 2003, pp. 4-5.

competitive position and management. A utility's business profile is evaluated on a scale of one to ten. A rating of one denotes below average business risk, while a rating of ten denotes above average business risk.¹⁰ I imputed an S&P business profile score for the Company, since it does not have one. I began with eleven water companies with S&P business profile scores listed in S&P *Utilities & Perspectives*. Of these eleven water utilities, eight are assigned a business profile score of 3 and three are assigned a business profile score of 2.¹¹ The average business profile score of the eleven water utilities is 2.73. From that average business profile score, I concluded that a business profile score of 3 would be a reasonable estimate for the Company.

Cost of Short-term Debt

Q. What is CIWC's cost of short-term debt?

A. CIWC issues short-term debt in the form of bank loans. The interest rate on those loans equals the thirty to 360-day London Interbank Offered Rate ("LIBOR") plus sixty-five basis points.¹² For the cost of short-term debt, I added

⁹ Standard and Poor's Ratings Direct, "Research: Pennsylvania Suburban Water Co. Ratings Removed From Watch, Outlook Stable; Ratings Affirmed," September 3, 2003, p. 1.

¹⁰ Standard & Poor's, *Corporate Ratings Criteria 2002*, www.standardandpoors.com/ratings, p. 17.

¹¹ Standard & Poor's, *Utilities & Perspectives*, August 11, 2003, pp. 15-16.

¹² Company's Schedule D-2, p. 1.

161 65 basis points to the August 11, 2003 three month LIBOR rate, 1.13%, for a
162 total cost of 1.78%.¹³

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¹³ The Wall Street Journal, August 11, 2003, p. C11.

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Cost of Long-Term Debt

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Q. What is the embedded cost of long-term debt for CIWC?

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A. As shown on Schedule 3.03, the average embedded cost of long-term debt for

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2004 equals 7.90%, which agrees with the Company's estimate.

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Cost of Preferred Stock

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Q. What is the embedded cost of preferred stock for CIWC?

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A. As shown on Schedule 3.04, the average embedded cost of preferred stock for

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2004 equals 5.48%, which agrees with the Company's estimate.

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Cost of Common Equity

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Q. How did you measure the investor-required rate of return on common equity for CIWC?

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A. I measured the investor-required rate of return on common equity for CIWC with

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discounted cash flow ("DCF") and risk premium models. Since CIWC does not

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have market-traded common stock, DCF and risk premium models cannot be

177 applied directly to CIWC; therefore, I applied both models to water utility and
178 public utility samples.¹⁴

179 **Sample Selection**

180 **Q. How did you select your water sample?**

181 A. I selected my water sample based on two criteria. First, I began with a list of all
182 domestic corporations assigned an industry number of 4941 (i.e., water utilities)
183 from *Standard & Poor's Utility Compustat*. Second, I removed any company that
184 had neither Zacks Investment Research ("Zacks") nor Institutional Brokers
185 Estimate System ("IBES") long-term growth rates. The remaining companies,
186 American States Water Company; Artesian Resources; California Water Service
187 Group; Middlesex Water Company; Philadelphia Suburban Corporation;
188 Southwest Water Company; and York Water Company, compose my sample.

189 **Q. How did you select a utility sample comparable in risk to CIWC?**

190 A. To form the utility sample, I began with a list of all domestic publicly traded
191 corporations assigned an industry number of 4911, 4922, 4923, 4924, 4931, or
192 4932 in the S&P *Utility Compustat II* database that matched CIWC's implied
193 business profile score of 3 or stronger. Second, I removed any company that
194 had an S&P debt rating other than AA, AA-, A+, A, or A-. Next, I removed any

¹⁴ Hereafter referred to as *water sample* and *utility sample*, respectively.

company that lacked either Zacks or IBES growth rates. Finally, I eliminated any company that was in the process of being acquired by another company. The remaining companies, AGL Resources Inc.; Consolidated Edison Inc.; Laclede Gas Co.; Nicor Inc.; Northwest Natural Gas Co.; Nstar; Piedmont Natural Gas Co; and WGL Holdings Inc., compose my utility sample.

DCF Analysis

Q. Please describe DCF analysis.

A. For a utility to attract common equity capital, it must provide a rate of return on common equity sufficient to meet investor requirements. DCF analysis establishes a rate of return directly from investor requirements. A comprehensive analysis of a utility's operating and financial risks becomes unnecessary in DCF analysis since the market price of a utility's stock already embodies the market consensus of those risks.

According to DCF theory, a security price equals the present value of the cash flow investors expect it to generate. Specifically, the market value of common stock equals the cumulative value of the expected stream of future dividends after each is discounted by the investor-required rate of return.

Q. Please describe the DCF model with which you measured the investor-required rate of return on common equity.

A. As it applies to common stocks, DCF analysis is generally employed to determine appropriate stock prices given a specified discount rate. Since a DCF model incorporates time-sensitive valuation factors, it must correctly reflect the timing of the dividend payments that stock prices embody. As such, incorporating stock prices that the financial market sets on the basis of quarterly dividend payments into a model that ignores the time value of quarterly cash flows constitutes a misapplication of DCF analysis.

The companies in both samples pay dividends quarterly; therefore, I applied a constant-growth DCF model that measures the annual required rate of return on common equity as follows:

$$k = \frac{\sum_{q=1}^4 D_{1,q} (1 + k)^{1 - [x + 0.25(q-1)]}}{P} + g.$$

where: P \equiv the current stock price;
 $D_{1,q}$ \equiv the next dividend paid at the end of quarter q , where $q = 1$ to 4;
 k \equiv the cost of common equity;
 x \equiv the elapsed time between the stock observation and first dividend payment dates, in years; and
 g \equiv the expected dividend growth rate.

225 That model assumes dividends will grow at a constant rate, and the market value
226 of common stock (i.e., stock price) equals the sum of the discounted value of
227 each dividend.

228 **Q. How did you estimate the growth rate parameter?**

229 A. Determining the market-required rate of return with the DCF methodology
230 requires a growth rate that reflects the expectations of investors. Although the
231 current market price reflects aggregate investor growth expectations, market-
232 consensus expected growth rates cannot be measured directly. Therefore, I
233 measured market-consensus expected growth rates indirectly with security
234 analysts' growth rate forecasts.

235 **Q. Please describe the published growth rate forecasts used for the firms in**
236 **your samples.**

237 A. I examined analysts' projected earnings growth rates published on July 16, 2003
238 by IBES and August 11, 2003 by Zacks. IBES and Zacks summarize the
239 earnings growth expectations of financial analysts employed by the research
240 departments of investment brokerage firms. Both provide forward-looking,
241 expectational estimates of earnings growth. The growth rate estimates from IBES
242 and Zacks for each firm in my samples are presented on Schedule 3.05. For
243 those companies with growth rate estimates from both sources, I averaged the
244 IBES and Zacks growth rates.

245 **Q. How did you measure the stock price?**

246 A. A current stock price reflects all information that is available and relevant to the
247 market; thus, it represents the market's assessment of the common stock's
248 current value. I measured each company's current stock price with its closing
249 market price from August 11, 2003. Those stock prices appear on Schedule
250 3.06.

251 Since stock prices reflect both the market's expectation of the cash flows the
252 securities will produce and the rate at which those cash flows are discounted, an
253 observed change in the market price does not necessarily indicate a change in
254 the required rate of return on common equity. Price changes may reflect an
255 investor re-evaluation of the expected dividend growth rate. In addition, stock
256 prices change with the approach of dividend payment dates. Consequently,
257 when estimating the required return on common equity with the DCF model, one
258 should measure the expected dividend yield and the corresponding expected
259 growth rate concurrently.

260 **Q. Please explain the significance of the column titled "Next Dividend**
261 **Payment Date" shown on Schedule 3.06.**

262 A. Estimating year-end dividend values requires measuring the length of time
263 between each dividend payment date and the first anniversary of the stock
264 observation date. For the first dividend payment, that length of time is measured

265 from the “Next Dividend Payment Date.” Subsequent dividend payments occur
266 in quarterly intervals.

267 **Q. How did you estimate the next four expected quarterly dividends?**

268 A. Most utilities declare and pay the same dividend per share for four consecutive
269 quarters before adjusting the rate. Consequently, I assumed the dividend rate
270 will adjust during the same quarter it changed during the preceding four quarters.
271 If the utility did not change its dividend during the previous four quarters, I
272 assumed the rate would change during the next quarter. For the quarter in which
273 the dividend rate is expected to adjust, if the utility has already declared a new
274 dividend rate then the expected dividend rate equals that newly declared
275 dividend rate. Otherwise, the expected dividend rate equals the sum of one plus
276 the average expected growth rate $(1+g)$ times the current dividend rate $D_{0,q}$.
277 Schedule 3.06 presents the current quarterly dividends. Schedule 3.07 presents
278 the expected quarterly dividends.

279 **Q. Based on your DCF analysis, what is the estimated required rate of return**
280 **on common equity for the water sample and the utility sample?**

281 A. The DCF analysis estimates the required rate of return on common equity is
282 9.74% for the water sample and 9.75% for the utility sample, as shown on
283 Schedule 3.08. Those estimates are derived from the growth rates from

284 Schedule 3.05, the stock price and dividend payment dates from Schedule 3.06,
285 and the expected quarterly dividends from Schedule 3.07.

286 **Risk Premium Analysis**

287 **Q. Please describe the risk premium model.**

288 A. The risk premium model is based on the theory that the market-required rate of
289 return for a given security equals the risk-free rate of return plus a risk premium
290 associated with that security. A risk premium represents the additional return
291 investors expect in exchange for assuming the risk inherent in an investment.
292 Mathematically, a risk premium equals the difference between the expected rate
293 of return on a risk factor and the risk-free rate. If the risk of a security is
294 measured relative to a portfolio, then multiplying that relative measure of risk and
295 the portfolio's risk premium produces a security-specific risk premium for that risk
296 factor.

297 The risk premium methodology is consistent with the theory that investors are
298 risk-averse. That is, investors require higher returns to accept greater exposure
299 to risk. Thus, if investors had an opportunity to purchase one of two securities
300 with equal expected returns, they would purchase the security with less risk.
301 Conversely, if investors had an opportunity to purchase one of two securities with
302 equal risk, they would purchase the security with the higher expected return. In

equilibrium, two securities with equal quantities of risk have equal required rates of return.

The Capital Asset Pricing Model ("CAPM") is a one-factor risk premium model that mathematically depicts the relationship between risk and return as:

$$R_j = R_f + \beta_j \times (R_m - R_f)$$

where: R_j \equiv the required rate of return for security j ;

R_f \equiv the risk-free rate;

R_m \equiv the expected rate of return for the market portfolio; and

β_j \equiv the measure of market risk for security j .

In the CAPM the risk factor is market risk, which is defined as risk that cannot be eliminated through portfolio diversification. To implement the CAPM, one must estimate the risk-free rate of return, the expected rate of return on the market portfolio, and a security or portfolio-specific measure of market risk.

Q. How did you estimate the risk-free rate of return?

A. I examined the suitability of the yields on three-month U.S. Treasury bills and thirty-year U.S. Treasury bonds as estimates of the risk-free rate of return.

Q. Why did you examine the yields on U.S. Treasury bills and bonds as measures of the risk-free rate?

317 A. The proxy for the nominal risk-free rate should contain no risk premium and
318 reflect similar inflation and real risk-free rate expectations to the security being
319 analyzed through the risk premium methodology.¹⁵ The yields of fixed income
320 securities include premiums for default and interest rate risk. Default risk
321 pertains to the possibility of default on principal or interest payments. Securities
322 of the United States Treasury are virtually free of default risk by virtue of the
323 federal government's fiscal and monetary authority. Interest rate risk pertains to
324 the effect of unexpected interest rate fluctuations on the value of securities.

325 Since common equity theoretically has an infinite life, its market-required rate of
326 return reflects the inflation and real risk-free rates anticipated to prevail over the
327 long run. U.S. Treasury bonds, the longest term treasury securities, were issued
328 with terms to maturity of thirty years; U.S. Treasury notes are issued with terms
329 to maturity ranging from two to ten years; U.S. Treasury bills are issued with
330 terms to maturity ranging from four weeks to six months. Therefore, U.S.
331 Treasury bonds are more likely to incorporate within their yields the inflation and
332 real risk-free rate expectations that drive, in part, the prices of common stocks
333 than either U.S. Treasury notes or Treasury bills.

334 However, due to relatively long terms to maturity, U.S. Treasury bond yields also
335 contain an interest rate risk premium that diminishes their usefulness as
336 measures of the risk-free rate. U.S. Treasury bill yields contain a smaller

¹⁵ Real risk-free rate and inflation expectations comprise the non-risk related portion of a security's rate of return.

premium for interest rate risk. Thus, in terms of interest rate risk, U.S. Treasury bill yields more accurately measure the risk-free rate.

Q. Given that the inflation and real risk-free rate expectations that are reflected in the yields on U.S. Treasury bonds and the prices of common stocks are similar, does it necessarily follow that the inflation and real risk-free rate expectations that are reflected in the yields on U.S. Treasury bills and the prices of common stocks are dissimilar?

A. No. To the contrary, short and long-term inflation and real risk-free rate expectations, including those that are reflected in the yields on U.S. Treasury bills, U.S. Treasury bonds, and the prices of common stocks, should equal over time. Any other assumption implausibly implies that the real risk-free rate and inflation is expected to systematically and continuously rise or fall.

Although expectations for short and long-term real risk-free rates and inflation should equal over time, in finite time periods, short and long-term expectations may differ. Short-term interest rates tend to be more volatile than long-term interest rates.¹⁶ Consequently, over time U.S. Treasury bill yields are less biased (i.e., more accurate) but less reliable (i.e., more volatile) estimators of the long-term risk-free rate than U.S. Treasury bond yields. In comparison, U.S. Treasury

¹⁶ Fabozzi and Pollack, ed., *The Handbook of Fixed Income Securities*, Fourth Edition, Irwin, p. 789.

bond yields are more biased (i.e., less accurate) but more reliable (i.e., less volatile) estimators of the long-term risk-free rate. Therefore, an estimator of the long-term nominal risk-free rate should not be chosen mechanistically. Rather, the similarity in current short and long-term nominal risk-free rates should be evaluated. If those risk-free rates are similar, then U.S. Treasury bill yields should be used to measure the long-term nominal risk-free rate. If not, some other proxy or combination of proxies should be found.

Q. What is the current yield on three-month U.S. Treasury bills and the current estimated yield on thirty-year U. S. Treasury bonds?

A. Three-month U.S. Treasury bills are currently yielding 0.96%. The estimated yield for Treasury bonds equals 5.50%.¹⁷ Both estimates are derived from quotes for August 11, 2003.¹⁸ Schedule 3.09 presents the published quotes and effective yields.

Q. Of the U.S. Treasury bill and bond yields, which is currently a better proxy for the long-term risk-free rate?

¹⁷ Since the suspension of the 30-year U.S. Treasury bond, the U.S. Treasury publishes a Long-Term Average Rate ("LTAR"), which represents the arithmetic average of the bid yields on all outstanding fixed-coupon securities with 25 years or more remaining to maturity. Additionally, the U.S. Treasury publishes daily linear extrapolation factors that can be added to the LTAR to estimate a 30-year rate. www.treas.gov/offices/domestic-finance/debt-management/interest-rate/ltcompositeindex.html

¹⁸ The Federal Reserve Board, *Federal Reserve Statistical Release: Selected Interest Rates, H.15 Daily Update*, <http://www.federalreserve.gov/releases/H15/update/>, August 12, 2003.

370 A. In terms of the gross domestic product (“GDP”) price index, the Energy
371 Information Administration (“EIA”) forecasts the inflation rate will average 2.5%
372 annually during the 2003-2025 period.¹⁹ In terms of the Consumer Price Index
373 (“CPI”), the EIA forecasts the inflation rate will average 2.9% annually during the
374 2003-2025 period. In comparison, Global Insight forecasts that the GDP price
375 inflation will average 2.8% annually during the 2003-2028 period.²⁰ In terms of
376 the CPI, the *Survey of Professional Forecasters* (“Survey”) forecasts the inflation
377 rate will average 2.5% during the next ten years.²¹ In terms of real GDP growth,
378 EIA forecasts the real risk-free rate will average 3.1% during the 2003-2025
379 period;²² Global Insight forecasts the real risk-free rate will average 3.0% during
380 the 2003-2028 period;²³ and the Survey forecasts the real risk-free rate will
381 average 3.2% during the next ten years.²⁴ Those forecasts imply a long-term,
382 nominal risk-free rate between 5.7% and 6.0%.²⁵ Therefore, EIA, Global Insight,
383 and Survey forecasts of inflation and real GDP growth expectations suggest that,

¹⁹ Energy Information Administration, *EIA 2003 Long-Term Forecast*, Table 20, Macroeconomic Indicators.

²⁰ Global Insight, “The U.S. Economy: The 25 Year Focus,” Table 1, Winter 2003.

²¹ *Survey of Professional Forecasters*, Federal Reserve Bank of Philadelphia, www.phil.frb.org/files/spf/survq203.html, May 20, 2003. The Survey aggregates the forecasts of approximately thirty forecasters.

²² Energy Information Administration, *EIA 2003 Long-Term Forecast*, Table 20, Macroeconomic Indicators.

²³ Global Insight, “The U.S. Economy: The 25 Year Focus,” Table 1, Winter 2003.

²⁴ *Survey of Professional Forecasters*, Federal Reserve Bank of Philadelphia, www.phil.frb.org/files/spf/survq103.html, February 24, 2003.

²⁵ Nominal interest rates are calculated as follows:

$$r = (1 + R) \times (1 + i) - 1.$$

where r ≡ nominal interest rate;
 R ≡ real interest rate; and
 i ≡ inflation rate.

currently, the U.S. Treasury bond yield more closely approximates the long-term risk-free rate. It should be noted, however, the U.S. Treasury bond yield is an upwardly biased estimator of the long-term risk-free rate due to the inclusion of an interest rate risk premium associated with its relatively long term to maturity.²⁶

Q. Please explain why the real risk-free rate and the GDP growth rate should be similar.

A. Risk-free securities provide a rate of return sufficient to compensate investors for the time value of money, which is a function of production opportunities, time preferences for consumption, and inflation.²⁷ The real risk-free rate excludes the premium for inflation. The real GDP growth rate measures output of goods and services without reflecting inflation and, as such, also reflects both production opportunities and consumers' consumption preferences. Therefore, both the real GDP growth rate and the real risk-free rate of return should be similar since both are a function of production opportunities and consumption preferences without the effects of either a risk premium or an inflation premium.

Q. How was the expected rate of return on the market portfolio estimated?

A. The expected rate of return on the market was estimated by conducting a DCF

²⁶ For example, the current long-term government bond yield of 5.48% and the average historic realized horizon premium of 1.5% during the last 32 years (Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation, 2003 Yearbook*, p. 177) imply a risk-free rate of approximately 3.9%.

analysis on the firms comprising the S&P 500 Index ("S&P 500") as of July 1, 2003. That analysis used dividend information reported in the July 2003 edition of *Standard & Poor's Security Owner's Stock Guide* and July 1, 2003 closing market prices reported by the Chicago Board of Options Exchange. Growth rate estimates were obtained from the June 19, 2003 edition of *IBES Monthly Summary Data* and August 7, 2003, Zacks reports. Firms not paying a dividend as of July 1, 2003, or for which neither IBES nor Zacks growth rates were available, were eliminated from the analysis. The resulting company-specific estimates of the expected rate of return on common equity were then weighted using July 1, 2003 market value data from the Chicago Board of Options Exchange. The estimated weighted average expected rate of return for the remaining 359 firms, composing 83.76% of the market capitalization of the S&P 500, equals 13.66%.

Q. How did you measure market risk on a security-specific basis?

A. Beta measures risk in a portfolio context. When multiplied by the market risk premium, a security's beta produces a market risk premium specific to that security. I developed two distinct sample average betas for each of my samples, one based on the Value Line methodology ("Value Line beta") and the other based on the Merrill Lynch methodology ("Regression beta").²⁸

²⁷ Brigham and Houston, *Fundamentals of Financial Management*, 8th edition.

²⁸ The Regression beta methodology is the same as the Merrill Lynch methodology except the

When available, I used published Value Line beta estimates for each company in each sample.²⁹ For those companies that did not have published Value Line beta estimates, I calculated beta estimates using the Value Line methodology.³⁰ Value Line estimates beta for a security with the following model using an ordinary least-squares technique:³¹

$$R_{j,t} = a_j + \beta_j \times R_{m,t} + e_{j,t}$$

where $R_{j,t}$ \equiv the return on security j in period t ;
 $R_{m,t}$ \equiv the return on the market portfolio in period t ;
 a_j \equiv the intercept term for security j ;
 β_j \equiv beta, the measure of market risk for security j ; and
 $e_{j,t}$ \equiv the residual term in period t for security j .

A beta can be calculated for firms with market-traded common stock. Value Line calculates its betas in two steps. First, the returns of each company are regressed against the returns of the New York Stock Exchange Composite Index ("NYSE Index") to estimate a raw beta. The regression analysis employs 260 weekly observations of stock return data. Then, an adjusted beta is estimated through the following equation:

Regression beta methodology substitutes (1) total excess return data for the total price change data that the Merrill Lynch methodology uses and (2) the NYSE Composite Index for the S&P500 Index as a proxy for the market return. The former substitution does not significantly affect the beta estimate; however, using the NYSE Composite Index as a proxy for the market return produced higher utility betas than using the S&P500 Index.

²⁹ The Value Line Investment Survey, "Summary and Index," August 8, 2003, pp. 1-17.

³⁰ The Value Line service to which the Commission subscribes does not provide beta estimates for Artesian Resources, Middlesex Water, Southwest Water, or York Water.

³¹ Statman, Meir, "Betas Compared: Merrill Lynch vs. Value Line", *The Journal of Portfolio Management*, Winter 1981.

$$\beta_{adjusted} = 0.35 + 0.67 \times \beta_{raw}.$$

The regression analysis estimate of beta for a security or portfolio of securities is estimated with the following model using an ordinary least-squares technique:

$$R_{j,t} - R_{f,t} = a_j + \beta_j \times (R_{m,t} - R_{f,t}) + e_{j,t}$$

where $R_{j,t}$ \equiv the return on security j in period t ;

$R_{f,t}$ \equiv the risk-free rate of return in period t ;

$R_{m,t}$ \equiv the return on the market portfolio in period t ;

a_j \equiv the intercept term for security j ;

β_j \equiv beta, the measure of market risk for security j ; and

$e_{j,t}$ \equiv the residual term in period t for security j .

Next, a beta estimate for both samples was calculated in three steps using regression analysis. First, the U.S. Treasury bill return is subtracted from the average percentage change in the two samples' stock prices and the percentage change in the NYSE Index to estimate each portfolio's return in excess of the risk-free rate. Second, the excess returns of each of the two samples are regressed against the excess returns of the NYSE Index to estimate a raw beta. The regression analysis employs sixty monthly observations of stock and U.S. Treasury bill return data. Third, the beta is adjusted through the following equation:

$$\beta_{adjusted} = 0.33743 + 0.66257 \times \beta_{raw}.$$

Q. Why do you use an adjusted beta estimate?

447 A. I use an adjusted beta estimate for two reasons. First, betas tend to regress
448 towards the market mean value of 1.0 over time; therefore, the adjustment
449 represents an attempt to estimate a forward-looking beta. Second, empirical
450 tests of the CAPM suggest that the linear relationship between risk, as measured
451 by raw beta, and return may be flatter than the CAPM predicts. That is,
452 securities with raw betas less than one tend to realize higher returns than the
453 CAPM predicts. Conversely, securities with raw betas greater than one tend to
454 realize lower returns than the CAPM predicts. Adjusting the raw beta estimate
455 towards the market mean value of 1.0 compensates for the observed flatness in
456 the linear relationship between risk and return.³² Securities with betas less than
457 one are adjusted upwards thereby increasing the predicted required rate of return
458 towards observed realized rates of return. Conversely, securities with betas
459 greater than one are adjusted downwards thereby decreasing the predicted rate
460 of return towards observed realized rates of return.

461 **Q. What are the beta estimates for the water sample and the utility sample?**

462 A. The Value Line beta estimates average 0.57 for the water sample and 0.67 for
463 the utility sample. The Regression beta estimates are 0.43 and 0.52,
464 respectively. The average of the Value Line and Regression beta estimates
465 equals 0.50 for the water sample and 0.595 for the utility sample.

³² Litzenberger, Ramaswamy and Sosin, "On the CAPM Approach to the Estimation of A Public Utility's Cost of Equity Capital," *Journal of Finance*, May 1980, pp. 375-376.

466 **Q. What required rate of return on common equity does the risk premium**
467 **model estimate for the two samples?**

468 A. The risk premium model estimates a required rate of return on common equity of
469 9.58% for the water sample and 10.36% for the utility sample. The computation
470 of those estimates appears on Schedule 3.09.

471 **Cost of Equity Recommendation**

472 **Q. Based on your entire analysis, what is your estimate of the required rate of**
473 **return on the common equity for CIWC?**

474 A. A thorough analysis of the required rate of return on common equity requires
475 both the application of financial models and the analyst's informed judgment. An
476 estimate of the required rate of return on common equity based solely on
477 judgment is inappropriate. Nevertheless, because techniques to measure the
478 required rate of return on common equity necessarily employ proxies for investor
479 expectations, judgment remains necessary to evaluate the results of such
480 analyses. Along with DCF and risk premium analyses, I have considered the
481 observable 6.17% rate of return the market currently requires on A-rated utility

long-term debt.³³ Based on my analysis, in my judgment, the investor-required rate of return on common equity for CIWC is 9.86%.

Q. Please summarize how you arrived at the investor-required rate of return on common equity for CIWC.

A. The models from which the individual company estimates were derived are correctly specified and thus contain no source of bias. Moreover, I am unaware of bias in any of my proxies for investor expectations.³⁴ Consequently, estimates for a sample as a whole are subject to less measurement error than individual company estimates. I estimated the investor-required rate of return on common equity by: 1) averaging the DCF-derived estimates of the required rate of return on common equity, or 9.75%, 2) averaging the risk premium-derived estimates of the required rate of return on common equity, or 9.97%, and 3) taking the midpoint of the DCF and risk premium derived estimates, or 9.86%.

Overall Cost of Capital Recommendation

Q. What is the overall cost of capital for CIWC in this proceeding?

³³ Selection and Opinion, Value Line, August 15, 2003, p. 9.

³⁴ Except as discussed above in regard to U.S. Treasury bond yields as proxies for the long-term risk-free rate.

497 A. As shown on Schedule 3.01, the overall cost of capital estimate for CIWC is
498 8.87%. My cost of capital recommendation of 8.87% incorporates a cost of
499 common equity of 9.86%.

500 **Response to Ms. Ahern**

501 **Q. Please evaluate Ms. Ahern's analysis of CIWC's cost of common equity.**

502 A. Ms. Ahern's analysis contains several errors that lead her to over-estimate
503 CIWC's cost of common equity. Critical errors occur in, or are the result of, her
504 Discounted Cash Flow ("DCF"), Capital Asset Pricing Model ("CAPM"), Risk
505 Premium ("RPM"), and Comparable Earnings ("CEM") analyses. The most
506 significant flaws in Ms. Ahern's analysis of CIWC's cost of common equity are the
507 following:

- 508 1. Ms. Ahern's utility sample is riskier than CIWC.
- 509 2. Ms. Ahern's use of historical data in each of her models is problematic.
- 510 3. The growth rate Ms. Ahern used in her DCF model is questionable.
- 511 4. Ms. Ahern's CAPM analysis suffers from a number of errors, the most critical of
512 which are her flawed derivation of the overall market return (" R_m ") and an
513 improper use of adjusted betas in her "empirical" CAPM model.

- 514 5. Ms. Ahern's Risk Premium Model ("RPM") is flawed on several levels.
- 515 6. Ms. Ahern's Comparable Earnings Model ("CEM") is theoretically and empirically
- 516 invalid.
- 517 7. Ms. Ahern's inclusion of size-based risk premiums in her cost of equity is
- 518 unwarranted.

519 **Utility Sample**

520 **Q. How did you conclude that Ms. Ahern's utility sample is riskier than CIWC?**

521 A. Ms. Ahern presents the credit ratings and business profiles of the companies that

522 comprise her utility sample on page 2 of CIWC Exhibit No. 3, Schedule 13. Since

523 Ms Ahern failed to provide supporting documents for the credit ratings listed on

524 this page, I was unable to check the accuracy of the Moody's bond rating.³⁵

525 However, I found numerous errors in the Standard and Poor's data Ms. Ahern

526 presented. Specifically, Ms. Ahern erred when she used the ratings of sample

527 company subsidiaries even when those sample companies had published S&P

528 credit ratings and business position scores. Correcting this reveals that the

529 average credit rating and business position of her utility sample is less favorable

530 from a risk standpoint than she presented. Table 3 below lists the corrections to

531 Ms. Ahern's S&P credit ratings and business position scores.

Table 3: S&P Credit Ratings and Business Positions				
	per CIWC Exhibit No. 3 Schedule 13 page 2		Corrected	
Company	S&P Credit Rating	S&P Business Position	S&P Credit Rating	S&P Business Position
AGL Resources, Inc.		2		3
Cleco Corporation	BBB+	5	BBB	6
DPL Inc.		4		6
Middlesex Water Company	A+		A	
Philadelphia Suburban Corp.	AA-		A+	
Public Service Enterprise Group, Inc.	A-	3	BBB	6
Southern Company	A+		A	
TECO Energy, Inc.		4		5
WPS Resources Corporation	AA-	4	A	5

532 The Ahern utility sample's corrected average credit rating and business position
533 are A- and 4.1, respectively. In comparison to CIWC's implied credit rating of A+
534 and business position of 3, the S&P credit rating and business position scores
535 indicate that the Ahern utility sample has higher financial and business risk.

536 As discussed previously, two securities with equal quantities of risk have equal
537 required rates of return, but investors require higher returns to accept greater
538 exposure to risk. Therefore, to accurately estimate a company's cost of equity
539 through a proxy, that proxy must either have a similar risk level to the target
540 company, or an adjustment to the proxy's cost of common equity is necessary.

³⁵ Ms. Ahern was asked to provide the information in Staff data request SK 1.14. Ms Ahern failed to provide any documents supporting the Moody's credit ratings she presented in Schedule 13 on page 2.

541

Historical Data

542 **Q. Why is Ms. Ahern's use of historical data in her DCF, CAPM, RPM, and CEM**
543 **models improper?**

544 A. The use of historical data is problematic. First, historical data improperly favors
545 outdated information that the market no longer considers relevant over the most-
546 recently available information. Second, historical data reflects conditions that
547 may not continue in the future. In other words, use of average historical data
548 wrongly implies that securities data will revert to a mean. To the contrary,
549 security return movements approximate a random walk, which suggests no
550 tendency of mean reversion.³⁶ That is, in a random walk, the "future steps or
551 directions cannot be predicted on the basis of past actions."³⁷ Finally, even if
552 securities data were mean reverting, there is no method for determining the true
553 value of that mean. Consequently, sample means, which depend upon the
554 measurement period used, are substituted. Thus, any measurement period
555 chosen is arbitrary, rendering the results uninformative.

556 **Q. What historical data did Ms. Ahern use in her cost of equity analyses?**

557 A. Ms. Ahern used historical data, in part, to estimate the growth rates and dividend
558 yields in her DCF analysis, the spread between the AAA-rated corporate bond

³⁶ Burton G. Malkiel, *A Random Walk Down Wall Street*, Fourth Edition, Norton, 1985, pp. 132 and 146.
³⁷ *Id.*, at 16, *emphasis added*.

yields and A-rated utility bond yields and the equity risk premium in her RPM analysis, the market equity risk premium in her CAPM analysis, and the return on book common equity for the two groups of non-price regulated proxy companies in her CEM analysis.

Q. Please provide an example of how the use of historical data can distort cost of equity analyses.

First, consider Ms. Ahern's use of historical data³⁸ in determining the dividend yield (dividend ÷ stock price) in her DCF model. Since stock prices reflect all current information, only the most recent stock price can reflect the most recently available information. Historical stock prices must include observations that cannot reflect the most current information available to the market. For example, if the actual earnings for a company were much higher than anticipated, the market would react to that news and bid up its stock price. Consequently, the pre-earnings announcement stock prices would reflect obsolete information and understate the value of that company's stock.

Ms. Ahern claims that she used historical data to estimate the dividend yield because it "normalizes the recent volatility of the stock market which she believes is not representative [of] the period of time in which rates set in this docket will be

³⁸ Ms. Ahern used an average of the spot, 3 month, 6 month, and 12 month yields (CIWC Exhibit No. 3, p. 31).

577 in effect.”³⁹ While it is true that measurement error is a problem inherent in cost
578 of common equity analysis and should be reduced whenever possible,
579 introducing old stock prices into an analysis simply substitutes one alleged
580 source of measurement error, volatile stock prices, for another, irrelevant stock
581 prices. Stock prices can be influenced by temporary imbalances in supply and
582 demand; however, any distortions such imbalances might have on the measured
583 cost of common equity can be reduced through the use of samples, a technique
584 which Ms. Ahern already applies.

585 The CAPM calls for an estimate of the required rate of return on the market
586 portfolio. Ms. Ahern estimates the required rate of return on the market using, in
587 part, historical earned rates of return.⁴⁰ As proxies for current required rates of
588 return, historical earned returns possess several shortcomings. First, the returns
589 an investment generates are unlikely to have equaled investor return
590 requirements due to unpredictable economic, industry-related, or company-
591 specific events. Second, even if an investment’s return equaled investor
592 requirements in a given period, both the price of, and the investment’s sensitivity
593 to, each source of risk changes over time. Consequently, the past relationship
594 between two investments, such as common equity and debt, is unlikely to remain
595 constant. Third, the magnitude of the historical risk premium depends upon the
596 measurement period used. Unfortunately, no widely-accepted guidelines exist
597 for determining the appropriate measurement period. Thus, historical earned

³⁹ Company response to Staff Data Request SK 1.07.

598 rates of return will accurately estimate the required rate of return only through
599 random chance.

600 **Q. Has the Commission previously ruled on the use of historical data in**
601 **determining a company's cost of common equity before?**

602 A. Yes. In Docket No. 92-0357, a rate proceeding for Iowa-Illinois Gas and Electric
603 Company, the Commission Order stated, "[t]he Commission notes that the
604 investor-required return on common equity is a forward-looking concept. Mr.
605 Benore [the company witness], in many instances, inappropriately utilized
606 historical data to determine the Company's cost of equity."⁴¹ Similarly, in Docket
607 No. 95-0076, a rate proceeding for Consumers Illinois Water Company, the
608 Commission Order stated, "[t]he Commission also concludes that Staff's criticism
609 of Dr. Phillips' use of two-month average historical stock prices and historical
610 growth rates in his traditional DCF analysis, and historical risk premiums in his
611 risk premium analysis are valid. Historical data is inappropriate in determining a
612 forward-looking cost of equity because it contains information that may no longer
613 be relevant to investors."⁴²

614 **DCF Model**

615 **Q. How did Ms. Ahern derive the growth rate used in her DCF model?**

⁴⁰ CIWC Exhibit No. 3, p. 50, lines 18-20.

616 A. Ms. Ahern begins with seven types of growth rate estimates from three different
617 sources. Some are based on dividends per share ("DPS"), others on earnings
618 per share ("EPS"); some are historical, others projected; some are from Value
619 Line, others from Thomas FN/First Call, and still others she derived herself.⁴³
620 She used different combinations of those growth rates to derive two average
621 growth rate estimates ("Composite Growth Estimates"). Her final DCF-based
622 cost of equity estimate was the average of the DCF results obtained from using
623 the Composite Growth Estimates. Ms. Ahern's first Composite Growth Estimate
624 is the average of a) the mean of the highest and lowest growth estimates and b)
625 the mean of all seven growth estimates. The second Composite Growth
626 Estimate comprises the average of the Value Line and Thomas FN/First Call
627 forecasts of EPS growth for each company in her two samples.⁴⁴

628 **Q. Explain why Ms. Ahern's growth rate estimation procedure is questionable.**

629 A. In addition to the shortcomings of using historical data discussed previously, Ms.
630 Ahern's growth rate estimates reflect two major problems. First, missing data
631 undermines the integrity of Ms. Ahern's growth rate. Second, Ms Ahern
632 introduces circularity into the estimate of return on common equity by the
633 inclusion of the "BR+SV" growth estimate.

⁴¹ Order, Docket No. 92-0357, July 21, 1993, p. 66.

⁴² Order, Docket No. 95-0076, December 20, 1995, p. 70.

⁴³ CIWC Exhibit No. 3, Schedule 12, p. 1, columns 1-8.

⁴⁴ CIWC Exhibit No. 3, Schedule 12, p. 1, Column 7.

Ms. Ahern's averages of all growth rate types for each proxy group are uninformative because they include the Value Line Projected 2000-2002 to 2006-2008 Growth Rates for EPS and DPS, both of which suffer from missing data. For both proxy groups, the average Value Line Projected 2000-2002 to 2006-2008 EPS Growth Rates of 8.3% and 6.2% for the Water Group and Utility Group respectively, represent the upper extreme of the range of estimates she employs (2.8-8.3% and 2.1-6.8%).⁴⁵ Unfortunately, Value Line estimates are available for only three of the seven Water Group companies. That is, the range of estimates from which Ms. Ahern has employed the high-end reflects the growth rates of only three of the seven companies in her water sample.

In addition, Ms. Ahern's method of averaging growth rate types more heavily weights certain methods of growth rate estimation than others. The missing data causes Ms. Ahern to over-weight the growth rates of some companies at the expense of others. In the water sample for example, only three Value Line projected EPS growth rates are available. Since these three growth rates are the only ones incorporated into all three components of Ms. Ahern's Composite Growth Estimates, they comprise 41% of the average growth estimate she calculated for the entire sample. In contrast, the Thompson FN/First Call growth rates, which are available for all seven companies in the water sample, constitute less than 29% of Ms. Ahern's average growth rate. In addition, American States Water Co., California Water Service Group, and Philadelphia Suburban Corp.'s

⁴⁵ CIWC Exhibit No. 3, Schedule 12, p. 1, Column 5.

655 growth estimates comprise 77.7% of the water sample growth estimates, even
656 though there are seven companies in Ms. Ahern's Water sample. This is
657 illustrated on Schedule 3.10. Ms. Ahern provides no explanation for her unusual
658 weighting scheme.

659 The second problem with Ms. Ahern's growth rate estimates is the inclusion of
660 the "BR+SV" growth rates (Schedule 12, columns 3 and 8) among her seven
661 growth rate types. The BR+SV growth estimate introduces circularity in to the
662 estimate of return on common equity "R". Ms. Ahern must first estimate "R" in
663 order to estimate a growth rate using her BR+SV method. The resulting growth
664 estimate is then used in a calculation to estimate the return on common equity
665 "R".

666 Ms. Ahern's BR+SV method of estimating growth also suffers from 1) the same
667 missing data problem discussed previously; 2) a requirement to estimate four
668 variables, which increases the sources of estimation error four-fold compared to
669 the single source of estimation error when growth is estimated directly; and 3)
670 Ms. Ahern's incorrect substitution of the average return on all equity investment
671 for "R," which should be defined as the return on incremental investment only.
672 The latter is appropriate since "BR+SV" is supposed to measure sustainable
673 growth, which is derived from new investment. Obviously, the average return on
674 all equity investment includes existing assets, which cannot sustain growth
675 beyond their capacity.

676

CAPM Model

677 **Q. How did Ms. Ahern derive the overall market return she used in her CAPM**
678 **models?**

679 A. Ms. Ahern averaged two estimates of R_m to derive her estimate. One estimate is
680 the long-term historical total equity earned return rate of 12.2%, as reported by
681 Ibbotson Associates.⁴⁶ The other estimate is based on projections reported in
682 *The Value Line Investment Survey*.⁴⁷

683 For the Value Line estimate, Ms. Ahern added together dividend yield and price
684 appreciation projections in order to estimate R_m . As a proxy for the market
685 portfolio's dividend yield, Ms. Ahern adopted the median of estimated dividend
686 yields (for the next 12 months) of all dividend paying stocks under review in *The*
687 *Value Line Investment Survey* (2.15%).

688 For the proxy of expected growth in the market portfolio, Ms. Ahern adopted the
689 geometric average of the Value Line 12-month, 6-month, 3-month, and spot 3-5
690 year estimated median price appreciation potential of all 1700 stocks in the
691 hypothesized economic environment three to five years hence (16.47%). Those
692 two rates were added together for an R_m of 18.62%.

⁴⁶ CIWC Exhibit No. 3, p. 51.

⁴⁷ CIWC Exhibit No. 3, Schedule 14, p. 4, note (1).

693 **Q. Please explain the errors in those two approaches and how they may**
694 **corrupt her CAPM results.**

695 A. Ms. Ahern's Ibbotson-based estimate is based entirely on historical data, the use
696 of which has several shortcomings, as discussed previously.

697 Ms. Ahern's Value Line-based estimate of the required rate of return on the
698 market contains several errors. First, the median is a biased measure of the
699 aggregate market dividend yield and growth rate. The median of a sample is its
700 middle value; that is, the sample contains as many values above the median as it
701 contains below it. The magnitude of the difference between those other values
702 and the median is not considered. For example, the median of a set comprising
703 1, 3 and 5 equals 3. The median of a set comprising 1, 3 and 10 also equals 3;
704 although, the highest value in the latter set is double that in the former set.

705 In particular, the median fails to properly weight the relative value of the
706 securities composing the market portfolio. The common stocks of larger
707 companies have a greater effect on market returns because they constitute a
708 greater proportion of the market than those of smaller companies. Nevertheless,
709 the median growth estimate does not afford higher weights to larger companies,
710 and thus over-weights the contributions of smaller companies, which tend to
711 have greater growth potential.

Ms. Ahern's Value Line-based estimate compounds that problem by improperly drawing the median dividend yield and growth rates from two different samples. The median of estimated dividend yields is derived from dividend paying stocks only. That is, common stocks that do not pay dividends were excluded from the sample from which the median dividend yield was derived. Conversely, the median appreciation projection is an estimate of all stocks in the hypothesized economic environment, dividend paying or not. Obviously the dividend yield of non-dividend paying stocks is 0%. Therefore, the median dividend yield for all common stocks included in *The Value Line Investment Survey* would be lower than that for the subset of common stocks paying dividends. Thus, by adding the higher dividend yield of dividend paying stocks alone to the estimated price appreciation of all stocks, Ms. Ahern over-estimates the overall return on the market.

Q. Please describe the errors in Ms. Ahern's Empirical CAPM analysis.

A. Quantitative research suggests the relationship between risk and return is flatter than the CAPM predicts. The Empirical CAPM attempts to reproduce the observed relationship between risk and realized returns.⁴⁸ Since the adjustments to the CAPM that result in the Empirical CAPM are based on empirical testing rather than financial theory, the Empirical CAPM should be applied in a manner that is consistent with the conditions under which it was developed. Specifically, the measure of risk used within the Empirical CAPM must be consistent with that

used in the empirical studies from which the model was developed. Ms. Ahern failed in that regard. The basis of Ms. Ahern's Empirical CAPM is a book entitled *Regulatory Finance: Utilities' Cost of Capital* by Roger A. Morin.⁴⁹ That text, in turn, cites another study by Litzenberger, et. al.⁵⁰ Litzenberger et. al. adopts raw beta as the measure of risk in its tests of the relationship between risk and realized returns. In contrast, Ms. Ahern applies to both her Traditional and Empirical CAPM models Value Line adjusted betas,⁵¹ rather than the raw betas used in accordance with Litzenberger et. al. Importantly, Litzenberger et. al. suggest that globally adjusted betas,⁵² such as those which Value Line publishes, are a solution to the discrepancy between the theoretically predicted and empirically observed relationship between risk and return.⁵³ In other words, by using adjusted betas, Ms. Ahern has already effectively transformed her "Traditional" CAPM into an empirical CAPM model. Therefore, including an additional beta adjustment in her "Empirical" CAPM model results in inflated estimates of her samples' cost of common equity.

Q. Please demonstrate how Ms. Ahern's use of Value Line betas in her Empirical CAPM inflates her estimate of her sample's cost of common equity.

⁴⁸ CIWC Exhibit No. 3, p. 47.

⁴⁹ CIWC Exhibit No. 3, p. 47.

⁵⁰ Litzenberger, Ramaswamy and Sosin, "On the CAPM Approach to the Estimation of A Public Utility's Cost of Equity Capital," *Journal of Finance*, May 1980, pp. 369-383.

⁵¹ CIWC Exhibit No. 3, Schedule 14, pp. 2 and 3.

⁵² Litzenberger et. al. refers to betas adjusted in the manner of Merrill Lynch and Value Line as "globally

751 A. Ms. Ahern's Empirical CAPM can be depicted mathematically as follows:⁵⁴

752
$$R_j = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta_j \times (R_m - R_f)$$

753 That formula can be restated as follows:

754
$$R_j = R_f + (0.25 + 0.75 \times \beta_j) \times (R_m - R_f) \quad (1)$$

755 Consequently, the Empirical CAPM effectively substitutes a weighted average
756 beta for security *j*'s raw beta. In Ms Ahern's Empirical CAPM, the weighted
757 average beta effectively equals the sum of 0.25 times the market beta of 1.0, and
758 0.75 times security *j*'s raw beta. Yet, Value Line betas are already adjusted using
759 the following formula:

760
$$\beta_{Value\ Line} = 0.35 + 0.67 \times \beta_{raw}^{55}$$

761 Substituting the Value Line adjustment formula into the CAPM produces an
762 Empirical CAPM with slightly different parameters:

763
$$R_j = R_f + (0.35 + 0.67 \times \beta_j) \times (R_m - R_f)$$

adjusted."

⁵³ Litzenberger, Ramaswamy and Sosin, "On the CAPM Approach to the Estimation of A Public Utility's Cost of Equity Capital," *Journal of Finance*, May 1980, pp. 375-376.

⁵⁴ CIWC Exhibit No. 3, Schedule 14, p. 4, note (4).

⁵⁵ Statman, "Betas compared: Merrill Lynch vs. Value Line," *Journal of Portfolio Management*, Winter 1981, pp. 41-44.

Substituting Value Line betas into Ms. Ahern's Empirical CAPM in place of raw betas increases the weight (compare equations (1) and (2)) of the market beta (where $\beta=1$, i.e., the intercept) and reduces the weight of the raw beta:

$$R_j = R_f + (0.51 + 0.50 \times \beta_j) \times (R_m - R_f) \quad (2)$$

Therefore, including Value Line adjusted betas in Ms. Ahern's Empirical CAPM leads to an overstated estimate of the cost of common equity whenever the raw beta is less than one, since the weight of raw beta is being further reduced in favor of the market beta of 1.0.

Risk Premium Model

Q. Please explain Ms. Ahern's RPM analysis.

A. Ms. Ahern's RPM is essentially an average of two distinct risk premium models for each proxy group.⁵⁶ The following formula, derived on Schedule 3.11, depicts Ms. Ahern's RPM model as:

$$R_j = \frac{(R_{A2} + \beta_j \times RP_1) + (R_{A2} + RP_2)}{2}$$

Both models begin with the same "Adjusted Prospective Bond Yield," R_{A2} (7.2%), which, ostensibly, represents the prospective yield on bonds rated A2 by

⁵⁶ For presentation purposes, I will only address the proxy group of seven water companies; however, the proxy group of thirteen public utility companies is conceptually the same.

Moody's, the average credit rating of a proxy subgroup of four water companies. To R_{A2} , the first model adds the product of the Value Line adjusted Beta for a different proxy subgroup of three water companies, β_j , (0.63) and the average of the historical and forecasted risk premium estimates, RP_1 , (9.2%).⁵⁷ The second model⁵⁸ adds to R_{A2} an historical risk premium estimate, RP_2 , (4.5%). Inputting Ms. Ahern's estimates⁵⁹ produces a cost of equity estimate of 12.35% as shown below:

$$\text{Ahern Beta RPM} = (7.2\% + 0.63 \times 9.2\%) = 13.0\%$$

$$\text{Ahern Utility Historical RPM} = (7.2\% + 4.5\%) = 11.70\%$$

$$R_j = \frac{13.0\% + 11.70\%}{2} = 12.35\%$$

Q. Please describe the shortcomings of Ms. Ahern's risk premium model.

A. In addition to the inappropriate use of historical input data, as discussed previously, both of the models incorporated into Ms. Ahern's RPM analysis are also flawed in other respects. The Ahern Beta RPM ($R_{A2} + \beta_j \times RP_1$) is a CAPM derivation that uses biased proxies for the risk-free rate. There are two fundamental flaws to this approach. First, Ms. Ahern improperly applied a market risk premium-based beta to a non-market risk premium. Second, she inappropriately substituted two different long-term corporate bond yields for the risk-free rate within the same risk premium model. The Ahern Utility Historical

⁵⁷ Hereafter referred to as the "Ahern Beta RPM."

801 RPM ($R_{A2} + RP_2$) is also flawed, due to the improper derivation of the equity risk
802 premium.

803 **Q. Please explain why the application of a market risk premium-based beta to**
804 **a non-market risk premium is inappropriate.**

805 A. Beta measures a particular type of risk⁶⁰ and cannot be assumed to accurately
806 measure any other type of risk. To illustrate, an RPM that is derived from the
807 CAPM but substitutes a corporate bond yield for the risk-free rate ("Beta RPM")
808 can be depicted mathematically as follows:

$$809 \quad R_{\beta RPMj} = R_{A-bond} + \beta_j \times (R_m - R_{A-bond}) \quad (3)$$

where $R_{\beta RPM}$ ≡ the calculated rate of return for security j ;

R_{A-bond} ≡ the A-rated utility bond rate;

R_m ≡ the expected rate of return for the market portfolio; and

β_j ≡ the measure of risk for security j .

810 The above model is identical to the CAPM except that it substitutes a risky debt
811 rate, R_{A-bond} , for the risk-free rate, R_f , a substitution which has no basis in
812 financial theory. The CAPM can be expressed as:

$$813 \quad R_j = (1 - \beta_j) \times R_f + (\beta_j \times R_m)$$

814 Likewise, the Beta RPM can be rewritten as:

⁵⁸ Hereafter referred to as the "Ahern Utility Historical RPM."

⁵⁹ CIWC Exhibit No. 3, Schedule 13, pp. 1, 6, and 9.

⁶⁰ Beta risk is variously labeled "market", "nondiversifiable", or "systematic" risk.

$$R_{\beta RPMj} = (1 - \beta_j) \times R_{A-bond} + (\beta_j \times R_m)$$

Since the cost of risky debt, R_{A-bond} , exceeds the risk-free rate, R_f , a comparison of the CAPM and the Beta RPM above makes evident that the latter systematically underestimates the cost of equity for companies with a beta greater than one and overestimates the cost of common equity for all companies with betas less than one. Ms. Ahern's water and utility proxy subgroups have betas below one.⁶¹ Thus, the Beta RPM systematically over-estimates the cost of common equity for those proxy subgroups.

Q. Please explain the consequences of incorporating two different long-term corporate bond yields as substitutes for the risk-free rate in a risk premium model.

A. The first of the two models averaged in Ms. Ahern's risk premium analysis differs slightly from the basic Beta RPM depicted in Equation (3) above in that the Ahern Beta RPM substitutes two different long-term corporate bond yields for the risk-free rate rather than one. Ms. Ahern's implementation of the Beta RPM is shown below:

$$R_{\beta RPMj} = R_{utility A2} + \beta_j \times (R_m - R_{Corporate Aaa})$$

⁶¹ Only three of seven companies in the water proxy group and ten of thirteen companies in the utility proxy group have Value Line betas. Thus, all of Ms. Ahern's analyses that involve Value Line betas (i.e., CAPM, ECAPM, Beta RPM, and CEM), are based on subgroups of her proxy groups.

where $R_{Utility\ A2} \equiv$ Rate of return on A2-rated utility bonds; and.

$R_{Corporate\ Aaa} \equiv$ Rate of return on Aaa-rated corporate bonds.

A fundamental tenet of financial theory states that investors require identical returns from two securities with identical risk. Whenever $R_{Corporate\ Aaa}$ is not equal to $R_{Utility\ A2}$, then a Beta RPM violates that principle. To illustrate, consider a company j , whose risk is equal to that of the market ($\beta_m = \beta_j = 1$). Financial theory posits that the expected return on company j stock should equal that of the market. Substituting a beta of one into the above formula produces:

$$R_{\beta RPMj} = R_{Utility\ A2} + (R_m - R_{Corporate\ Aaa})$$

Whenever $R_{Utility\ A2} = R_{Corporate\ Aaa}$, the above formula will reduce to $R_j = R_m$, which conforms to the aforementioned tenet of financial theory. However, whenever $R_{Utility\ A2} \neq R_{Corporate\ Aaa}$, then $R_{\beta RPMj} \neq R_m$. That is, the estimated return for security j does not equal the estimated return on the market, although they both have the same risk level ($\beta_m = \beta_j = 1$). Ms. Ahern used an $R_{Utility\ A2}$ of 7.2% and an average $R_{Corporate\ Aaa}$ of 6.25%, with an average R_m of 15.4% in the Ahern Beta RPM. This would result in an estimated return ($R_{\beta RPMj}$) of 16.35% for a company with a beta of one (the same as the market), although the estimated market return (R_m) equals 15.4%. Clearly, the Ahern Beta RPM is theoretically untenable. In fact, for companies and proxy groups with a beta less than one, the Ahern Beta RPM will overestimate the cost of equity as long as $R_{Utility\ A2}$ exceeds $R_{Corporate\ Aaa}$.

850 **Q. Please explain how the equity risk premium in the Ahern Utility Historical**
851 **RPM ($R_{A2} + RP_2$) was improperly derived.**

852 A. To estimate the risk premium for the Ahern Utility Historical RPM (RP_2), Ms.
853 Ahern selected the historical measurement period of 1928-2001.⁶² First, Ms.
854 Ahern calculated a market equity risk premium by subtracting the Salomon
855 Brothers Long-Term High Grade Corporate Bond Index yield from the S&P Public
856 Utility Index (11.1% - 6.1% = 5.0%). Next, Ms. Ahern estimated the spread
857 between the Salomon Brothers Long-Term High Grade Corporate Bond Index
858 yield and A rated public utility bonds, to reflect the average rating of the proxy
859 group of seven. To do so, she subtracted the arithmetic mean yields on Aaa and
860 Aa rated bonds (used as a proxy for the Salomon Brothers Long-Term High
861 Grade Corporate Bond Index yield) from the yield on A rated public utility bonds
862 (6.62% - 6.15% = 0.47%, which she rounded to 0.5%). Finally, she calculated an
863 adjusted equity risk premium by subtracting the spread between the Salomon
864 Brothers Long-Term High Grade Corporate Bond Index yield and A rated public
865 utility bonds (0.5%) from the equity risk premium (5.0%).

866 The adjusted equity risk premium in the Ahern Utility Historical RPM analysis is
867 inappropriate for two reasons. First, it uses historical data, which, as discussed
868 previously, is inappropriate. Second, it is based upon S&P's Public Utility Index,
869 which Ms. Ahern has not demonstrated to be comparable in risk to CIWC.

⁶² CIWC Exhibit No. 3, Schedule 13, p. 8.

Comparable Earnings Model

870

871 **Q. Please describe the shortcomings of Ms. Ahern's comparable earnings**
872 **analysis.**

873 A. In addition to the use of historical data, Ms. Ahern's CEM suffers several other
874 shortcomings. First, the return estimated by the comparable earnings analysis
875 can be significantly distorted by accounting practices. Second, Ms. Ahern's
876 comparable earnings analysis relies on the erroneous notion that a combination
877 of realized and expected returns on book value ("accounting earnings") is an
878 appropriate estimate for investor-required returns. Third, the two comparable
879 earnings proxy samples have higher average Value Line betas, and are thus
880 riskier, than the samples they are supposed to represent. Finally, the validity of
881 the information from which Ms. Ahern forms her sample is questionable, the
882 reasons for which are discussed below. These shortcomings lead to the
883 conclusion that the comparable earnings model is not an appropriate method for
884 estimating the rate of return for CIWC.

885 **Q. Explain how accounting practices can distort the comparable earnings**
886 **analysis return estimate.**

887 A. Accounting returns between two companies may not be directly comparable,
888 particularly if those companies are from different industries. Differences in
889 accounting practices can have a significant impact on accounting rate of return.

Because of the sheer numbers involved, i.e., Ms. Ahern's comparison proxy groups consist of 96 and 75 non-utility companies for the water and utility subgroups, respectively; the comparability of the accounting earnings of the CEM non-utility samples to the Ahern water and utility proxy subgroups is highly questionable.

Q. Please explain why returns on book value are inappropriate estimators of investor-required returns.

A. The cost of common equity is the market-required rate of return demanded by investors. In contrast, Ms. Ahern's CEM is not a market-based methodology. The returns Ms. Ahern uses are based on the return on net worth (i.e., book value of common equity) reported in Value Line, rather than the return on market value.⁶³ The comparable earnings method incorrectly implies that the rate of return on book common equity is equivalent to current investor-required rates of return. There is simply no basis for that implication since the accounting return that the comparable earnings method measures may be more or less than the return investors require from an investment. For example, if the expected return is 20% while the investor-required rate of return is only 10%, investors will bid up the price in the marketplace until the expected returns on market equity equal the required 10% return. The market price of a common stock does not achieve equilibrium until the expected rate of return on the common stock equals the investor required rate of return. In contrast, the return on book value has no such

adjustment mechanism since the denominator, book value, is unresponsive to market forces. Ms. Ahern claims that her CEM model is market-based because she used market-based measures of risk to select the CEM samples.⁶⁴ If the required return from Ms. Ahern's CEM model is market based, then the measures of risk should be positively related with the measures of return. However, analysis of Ms. Ahern's data shows that the statistical relationship of her measures of risk with her measures of return is either negative or insignificantly different from zero.

Q. Please provide details about your statement that the two comparable earnings proxy samples have higher average Value Line betas, and are thus riskier, than the samples they are supposed to represent.

A. The CEM sample representing the Water Group has a Value Line beta of 0.72, while the three-company Water Subgroup's Value Line beta is 0.63. The CEM sample representing the Utility Group has a Value Line beta of 0.74, while the Utility Subgroup's Value Line beta is 0.70.⁶⁵ Thus, even if accounting earnings were representative of investor return requirements, which they are not, the comparable earnings model would overstate the cost of the equity estimates for both of Ms. Ahern's proxy subgroups.

⁶³ CIWC Exhibit No. 3, pp. 54 and 56.

⁶⁴ CIWC Exhibit No. 3, p. 53. For the purpose of this discussion only, I am assuming that Ms. Ahern's standard error of the residual qualifies as a market-based measure of risk (i.e., it measures a type of risk that is reflected in stock prices).

⁶⁵ CIWC Exhibit No. 3, Schedule 15, pp. 1-4.

929 **Q. Why is the validity of the information Ms. Ahern used to develop her**
930 **sample for her CEM analysis questionable?**

931 A. Ms. Ahern used unadjusted betas as one of her criteria in selecting her
932 samples.⁶⁶ The unadjusted betas Ms. Ahern presents in CIWC Exhibit No. 3,
933 Schedule 15 cannot be accurate. Value line only publishes its adjusted betas, so
934 the unadjusted betas must be calculated from the adjusted betas. The Value
935 Line adjustment discussed earlier can be applied to the adjusted betas to
936 determine the unadjusted beta by subtracting .35 from the adjusted beta then
937 dividing by .67. Applying the above formula to an adjusted beta of .65 (.625-.674
938 assuming rounding) result in an unadjusted beta of .4104 to .4836. Ms. Ahern
939 presents numerous adjusted betas of .65 and their corresponding unadjusted
940 betas range from .39 for Libbey Inc.⁶⁷ to .47 for Sensient Techn.⁶⁸ However,
941 Smucker (J.M.) and Kellogg have adjusted betas of .60 and .70 and an
942 unadjusted betas of .39 and .48,⁶⁹ respectively. It is evident that the information
943 provided for Libbey, Inc. and Kellogg is incorrect based upon the formula above.
944 In addition, it is impossible to have two equal unadjusted betas that have different
945 adjusted betas. Since Ms. Ahern would not provide the source document for the

⁶⁶ CIWC Exhibit No. 3, pp. 54-55.

⁶⁷ CIWC Exhibit No. 3, Schedule 15, p. 1.

⁶⁸ CIWC Exhibit No. 3, Schedule 15, p. 4.

⁶⁹ CIWC Exhibit No. 3, Schedule 15, pp. 3-4.

946 Schedule 15,⁷⁰ I could not verify the accuracy of all the information Ms. Ahern
947 used in her CEM model.

948 **Q. Has the Commission rejected use of the comparable earnings analysis to**
949 **measure a utility's cost of equity?**

950 A. Yes. The Commission rejected use of the comparable earnings methodology in
951 Docket Nos. 99-0121, 89-0033, and 92-0448/93-0239 Consol.⁷¹

952 **Size-based Risk Premium**

953 **Q. Is Ms. Ahern's adjustment for a size-based risk premium appropriate?**

954 A. No. First, Ms. Ahern's size-based risk premium has no theoretical basis. Rather,
955 it is based on an empirical study that is not applicable to CIWC. Second, Ms.
956 Ahern inappropriately applied her size-based risk premium to her overall analysis
957 rather than applying it to the CAPM and RPM analyses before averaging in the
958 DCF. Regardless, should a size-based risk premium be adopted, it should be
959 based on the size of CIWC's parent company, Philadelphia Suburban
960 Corporation ("PSC").

961 **Q. Why should the parent company be the basis for a size adjustment?**

⁷⁰ Staff data request SK 2.05 requested a copy of the source document, the Company's response was:

962 A. Although CIWC raises its own debt and preferred stock, it obtains common equity
963 financing from its parent company, PSC.⁷² PSC has a market capitalization of
964 over \$1.6 billion. Being a part of a much larger organization should enhance the
965 ability of CIWC to access the equity market on reasonable terms. When utilities
966 combine, reductions in costs resulting from efficiencies should be passed on to
967 customers in the form of lower rates. Such economies of scale are often
968 advanced to justify utility combinations. Financial capital costs are also subject
969 to economies of scale. If the risk inherent in a utility common stock is a function
970 of that utility's size, then the larger size of PSC should translate into a decreased
971 cost of common equity, in comparison to that of a company the size of CIWC. If
972 a risk premium were based on the size of CIWC, rate payers would be denied the
973 benefits associated with the combined entity's stronger financial profile.

974 **Q. Please explain the significance of the absence of a theoretical basis for a**
975 **size-based risk premium.**

976 A. Since a size-based risk premium has no theoretical basis, to the extent that a
977 correlation between firm size and return exists, that relationship is likely the result
978 of some other factor or factors that are related to both size and return, such as
979 liquidity or information costs. Relatively illiquid securities impose costs on
980 investors since they may be unable to sell illiquid securities at a fair price on a

"Ms. Ahern is unable to provide the entire database".

⁷¹ Order, Docket 99-0121, August 25, 1999, p. 68; Order on Remand, Docket No. 89-0033, November 4, 1991, p. 15; Order, Docket No. 92-0448/93-0239 Consol., October 11, 1994, p. 173.

⁷² Company's supplemental responses to data requests SK 1.23 and SK 1.24.

timely basis. The securities of smaller companies tend to be less liquid than those of larger companies since the potential breadth of the market for the former tends to be more limited. In addition, gathering information regarding the expected cash flows and risks of a security imposes costs an investor must recover through the returns that security generates. If fewer sources of information regarding smaller companies exist, then obtaining information might be more expensive.

If the securities of PSC are less liquid or the availability of information regarding PSC is more restricted than the average security, then adding a liquidity premium to a CAPM analysis of CIWC's cost of common equity might be proper. However, Ms. Ahern has not provided any evidence to demonstrate that a size premium is warranted for utilities. The study reported in Ibbotson Associates, which forms the basis of Ms. Ahern's size-based risk premium adjustment,⁷³ is not restricted to utilities. Rather, it is based on the stocks listed on the New York Stock Exchange ("NYSE"), American Stock Exchange ("AMEX"), and National Association of Security Dealers Automated Quotation System ("NASDAQ").⁷⁴ In addition, the Brigham text that Ms. Ahern also cites in support of her sized-based premium adjustment does not specifically refer to utility stocks, either. Further, the Brigham text defines a small firm as one with a market capitalization of less than \$20 million, which is far below CIWC's \$110 million in book capitalization.⁷⁵

⁷³ CIWC Exhibit No. 3, p. 60 and Company response to Staff Data Request SK 1.06.

⁷⁴ Ibbotson Associates, *S&P 2003 Yearbook*, pp. 136.

⁷⁵ CIWC Exhibit No. 3, p. 12 and Company response to Staff Data Request SK 1.05.

1001 Thus, the entire basis of Ms. Ahern's size-based risk premium is questionable at
1002 best.

1003 Utilities, unlike most stocks listed on the NYSE, AMEX, or NASDAQ, are subject
1004 to uniform reporting requirements. Furthermore, their rates and conditions of
1005 service are publicly reported. Therefore, the cost of obtaining information
1006 regarding smaller utilities in general, and CIWC in particular, is unlikely to be as
1007 high as that of unregulated companies that are similar in size; hence, the
1008 application of a size-based premium to a utility is highly questionable.

1009 In fact, in direct contrast with Ms. Ahern's claims, a study by Annie Wong,
1010 reported in the Journal of the Midwest Finance Association, specifically found no
1011 justification for a size premium for utilities.⁷⁶

1012 Even for non-utilities, evidence of the existence of a size-based risk premium is
1013 not very strong. Fernholz found that a statistical property he termed the
1014 "crossover effect" was the primary cause of the difference between large and
1015 small company stock returns. The "crossover effect" measures the effect on rate
1016 of return of those stocks that switch from one size portfolio to another.⁷⁷
1017 Fernholz states that as random price changes affect the size of stocks, some
1018 stocks cross over from one size portfolio to another. When a stock that starts in

⁷⁶ Wong, "Utility Stocks and the Size Effect: an Empirical Analysis," *Journal of the Midwest Finance Association*, 1993.

⁷⁷ Fernholz, "Crossovers, Dividends, and the Size Effect," *Financial Analysts Journal*, May/June 1998, pp. 73-75.

the large stock portfolio experiences a random negative price change that moves it into the small stock portfolio, its resulting negative return is assigned to, and therefore reduces, the return on the large stock portfolio. Conversely, when that same stock experiences a random positive price change that moves it back into the large stock portfolio, its resulting positive return is assigned to, and therefore increases, the return on the small stock portfolio.⁷⁸ The combination of portfolio construction and random (i.e., non-systematic) price movements creates a biased source of measurement error. Thus, the “small stock effect” may be less a market return phenomenon than a modeling problem. That is, the “small stock effect” may be nothing more than a statistical anomaly.

In another study of domestic stocks listed on the NYSE and AMEX, Jensen, Johnson and Mercer, (hereinafter “Jensen”) found that small stock premiums appear to be related to monetary policy. Specifically, changes in monetary policy play a prominent role in determining the magnitude of small stock premiums. During expansive monetary periods, defined as months following a reduction in the Federal Reserve discount rate, Jensen found that small stock returns were significantly greater than large stock returns. Conversely, during restrictive monetary periods, defined as months following an increase in the discount rate, Jensen found that small stock returns were not significantly greater than large stock returns.⁷⁹ Nevertheless, the applicability of the Jensen results to small

⁷⁸ Fernholz, “Crossovers, Dividends, and the Size Effect,” *Financial Analysts Journal*, May/June 1998, p. 73.

⁷⁹ Jensen, Johnson, and Mercer, “The Inconsistency of Small-Firm and Value Stock Premiums,” *Journal of Portfolio Management*, p. 35.

1039 utility stocks is doubtful. First, since the Jensen study was based on largely non-
1040 utility companies, its findings that small stocks outperformed large stocks during
1041 “expansionary” monetary periods is not surprising. During monetary expansions,
1042 as the supply of loanable funds increases, investors are more likely to invest in
1043 speculative, small company stocks. However, during monetary contractions, as
1044 the supply of loanable funds decreases, investors are more likely to switch from
1045 speculative investments to safer ones – the well-known “flight to quality.” It is
1046 counter-intuitive to claim that investors would consider the smaller firms in the
1047 regulated utility sector to be speculative investments; and Ms. Ahern has not
1048 supported that premise. Moreover, the Jensen study did not control its
1049 measurement of the small stock premium for risk as measured by beta or other
1050 means.⁸⁰ Therefore, the study does not support Ms. Ahern’s size-based risk
1051 premium adjustment.

1052 Even if a size-based risk premium exists for utilities, which it does not, Ms.
1053 Ahern’s estimates of the size of the premium are questionable. First, Ms.
1054 Ahern’s size-based risk premiums are based on historical returns whose
1055 shortcomings as proxies for expected returns were previously addressed.

1056 Second, Ms. Ahern’s application of a size-based risk premium, on the basis of
1057 Ibbotson Associates’ historical size-based risk premiums, is probably inconsistent
1058 with the manner in which Ibbotson Associates measured the historical size-based

⁸⁰ Jensen, Johnson, and Mercer, “The Inconsistency of Small-Firm and Value Stock Premiums,” *Journal of Portfolio Management*, pp. 30 and 34.

1059 risk premiums. While Ms. Ahern adds a size-based premium to her CAPM-
1060 based risk premium analysis, which is based on adjusted Value Line betas, the
1061 studies I have reviewed on the effect of size on returns employ raw betas.⁸¹
1062 Since the Ibbotson Associates size-based risk premiums are a function of raw
1063 beta, Ms. Ahern should have used the same type of betas as Ibbotson
1064 Associates.

1065 **Q. Has the Commission ruled on a size-based risk premium before?**

1066 A. Yes. A size-based risk premium was presented in Consumers Illinois Water rate
1067 case Docket No. 97-0351. It was rejected on the basis that the company witness
1068 failed to demonstrate that there is a direct relationship between the size of a
1069 utility and its risk.⁸²

1070 **Q. Does this conclude your direct testimony?**

1071 A. Yes, it does.

⁸¹ Wong, "Utility Stocks and the Size Effect: an Empirical Analysis," *Journal of the Midwest Finance Association*, 1993, p. 96; Ibbotson, Kaplan and Peterson, "Estimates of Small-Stock Betas Are Much Too Low," *Journal of Portfolio Management*, Summer 1997, p. 106.

⁸² Amended Order, Docket No. 97-0351, June 17, 1998, p. 39.

Consumers Illinois Water Company

Staff's Proposed Weighted Average Cost of Capital

<u>Class of Capital</u>	<u>Future Test Year 2004 Balance</u>	<u>Percent of Total Capital</u>	<u>Cost</u>	<u>Weighted Cost</u>
Short-Term Debt	\$ 395,833	0.37%	1.78%	0.01%
Long-Term Debt	\$ 52,340,300	48.22%	7.90%	3.81%
Preferred Stock	\$ 382,797	0.35%	5.48%	0.02%
Common Equity	\$ 55,429,929	51.06%	9.86%	5.03%
Total	<u>\$ 108,548,859</u>	<u>100.0%</u>		<u>8.87%</u>

Company's Proposed Weighted Average Cost of Capital

<u>Class of Capital</u>	<u>Future Test Year 2004 Balance</u>	<u>Percent of Total Capital</u>	<u>Cost</u>	<u>Weighted Cost</u>
Short-Term Debt	\$ 1,764,583	1.61%	3.25%	0.052%
Long-Term Debt	\$ 52,340,302	47.62%	7.90%	3.762%
Preferred Stock	\$ 382,797	0.35%	5.48%	0.019%
Common Equity	\$ 55,429,929	50.43%	10.75%	5.421%
Total	<u>\$ 109,917,611</u>	<u>100.0%</u>		<u>9.25%</u>

Consumers Illinois Water Company

Balance of Short-term Debt
Average 2004

End of Month Balance					
Date (A)	Gross Short-term Debt Outstanding (B)	CWIP (C)	CWIP Accruing AFUDC (D)	Net Short-term Debt Outstanding (E)	Monthly Average (F)
Dec-03	\$ 250,000	\$ 2,100,000	\$ 2,100,000	\$ -	
Jan-04	250,000	2,100,000	\$ 2,100,000	-	\$ -
Feb-04	250,000	2,100,000	\$ 2,100,000	-	-
Mar-04	250,000	2,100,000	\$ 2,100,000	-	-
Apr-04	750,000	2,100,000	\$ 2,100,000	-	-
May-04	1,150,000	2,100,000	\$ 2,100,000	-	-
Jun-04	2,100,000	2,100,000	\$ 2,100,000	-	-
Jul-04	2,350,000	2,100,000	\$ 2,100,000	250,000	125,000
Aug-04	2,600,000	2,100,000	\$ 2,100,000	500,000	375,000
Sep-04	2,850,000	2,100,000	\$ 2,100,000	750,000	625,000
Oct-04	3,350,000	2,100,000	\$ 2,100,000	1,250,000	1,000,000
Nov-04	3,600,000	2,100,000	\$ 2,100,000	1,500,000	1,375,000
Dec-04	3,100,000	2,100,000	\$ 2,100,000	1,000,000	1,250,000
Average Balance of Short-Term					\$ 395,833

Consumer Illinois Water Company

Embedded Cost of Debt

Line No.	Issue	Date Issued	Maturity Date	Principal		Unamortized Debt Expense or Discount	Carrying Value	Interest Cost	Annual Amortization of		Embedded Cost
				Original Principal Amount	Average 2004 Outstanding				Debt Expense or Discount	Annualized Interest	
1	FMB Series M-10.40%	12/6/88	12/1/18	\$ 6,000,000	\$ 6,000,000	\$ 86,492	5,913,508	\$ 624,000	\$ 5,999	629,999	
2	FMB Series N-9.69%	3/15/91	3/1/21	4,500,000	4,500,000	70,660	4,429,340	436,050	4,229	440,279	
3	FMB Series O-7.63%	9/21/95	9/1/25	8,000,000	8,000,000	59,718	7,940,282	610,400	2,810	613,210	
4	FMB Series P-9.19%	7/24/92	7/15/22	6,000,000	6,000,000	29,200	5,970,800	551,400	1,615	553,015	
5	FMB Series U-5.00%	11/1/02	11/1/32	9,970,000	9,970,000	729,002	9,240,998	498,500	25,579	524,079	
6	FMB Series T-4.90%	11/1/02	11/1/32	2,785,000	2,785,000	202,605	2,582,395	136,465	7,109	143,574	
7	FMB Series S-5.40%	9/1/00	9/30/30	4,500,000	4,500,000	287,044	4,212,956	243,000	10,970	253,970	
8	FMB Series V-6.00%	12/31/03	12/31/33	13,150,000	13,150,000	600,000	12,550,000	789,000	20,000	809,000	
9	Non-Interest Bearing Note	6/17/75		294,924	49,400	-	49,400	-	-	-	
10	Aroma Park-8.00%			1,000,000	1,000,000	-	1,000,000	80,000	-	80,000	
11	Reacquired Debt	Amortization Period				<u>Loss</u>			<u>Loss</u>		
12	Series I - 9.19%	7/24/92	7/15/22	6,000,000	0	93,242	(93,242)	-	5,180	5,180	
13	Tax Exempt - 7.50%	2/1/90	2/1/20	10,000,000	0	626,702	(626,702)	-	39,992	39,992	
14	Series Q - 6.10%	9/21/95	9/1/25	10,000,000	0	646,959	(646,959)	-	31,733	31,733	
15	Series R - 6.00%	9/21/95	9/1/25	2,800,000	0	182,476	(182,476)	-	8,950	8,950	
18	Totals			<u>\$ 84,999,924</u>	<u>\$ 55,954,400</u>	<u>\$ 3,614,100</u>	<u>\$ 52,340,300</u>	<u>\$ 3,968,815</u>	<u>\$ 164,166</u>	<u>\$ 4,132,981</u>	<u>7.90%</u>

Preferred Stock Issuance	Dividend Rate	Shares Outstanding	Balance Outstanding	Unamortized Premium	Expense	Total Balance	Annual Dividends	Amortization of Expense	Discount	Total
Cumulative Preferred	5.50%	4,000	\$ 381,200	\$ 3,970	\$ 2,373	\$ 382,797	\$ 20,966			\$ 20,966
Embedded Cost of Preferred Stock										5.48%

Consumers Illinois Water Company

Growth Rates

Water Sample

<u>Company</u>	<u>Zacks Earnings</u>	<u>IBES Earnings</u>	<u>Average</u>
1 American States Water	3.00%	3.00%	3.00%
2 Artesian Resources	8.00%	8.00%	8.00%
3 California Water Services	3.00%	3.00%	3.00%
4 Middlesex Water	7.00%	7.00%	7.00%
5 Philadelphia Suburban Corp.	8.42%	8.80%	8.61%
6 Southwest Water	7.00%	9.00%	8.00%
7 York Water Co.	7.00%	7.00%	7.00%

Utility Sample

<u>Company</u>	<u>Zacks Earnings</u>	<u>IBES Earnings</u>	<u>Average</u>
1 AGL Resources	6.00%	5.53%	5.77%
2 Consolidated Edison	2.90%	3.16%	3.03%
3 Laclede Group	4.00%	4.00%	4.00%
4 Nicor Inc	5.30%	4.38%	4.84%
5 Northwest Natural Gas	4.56%	4.67%	4.62%
6 NSTAR	4.50%	5.60%	5.05%
7 Piedmont Natural Gas	5.00%	5.00%	5.00%
8 WGL Holdings Inc	3.86%	4.43%	4.15%

Consumers Illinois Water Company

Water Sample

Company	Current Dividend				Next Dividend Payment Date	Stock Price
	D _{0,1}	D _{0,2}	D _{0,3}	D _{0,4}		
1 American States Water	\$ 0.221	\$ 0.221	\$ 0.221	\$ 0.221	12/01/03	\$ 23.800
2 Artesian Resources	0.193	0.198	0.198	0.198	11/21/03	24.990
3 California Water Services	0.280	0.281	0.281	0.281	11/15/03	25.790
4 Middlesex Water	0.210	0.215	0.215	0.215	09/02/03	25.300
5 Philadelphia Suburban Corp.	0.133	0.140	0.140	0.140	09/01/03	23.270
6 Southwest Water	0.056	0.056	0.056	0.058	10/21/03	13.440
7 York Water Co.	0.130	0.135	0.135	0.135	10/15/03	18.250

Utility Sample

Company	Current Dividend				Next Dividend Payment Date	Stock Price
	D _{0,1}	D _{0,2}	D _{0,3}	D _{0,4}		
1 AGL Resources	\$ 0.270	\$ 0.270	\$ 0.270	\$ 0.280	09/01/03	\$ 27.590
2 Consolidated Edison	0.555	0.560	0.560	0.560	12/15/03	39.940
3 Laclede Group	0.335	0.335	0.335	0.335	10/01/03	25.740
4 Nicor Inc	0.460	0.460	0.465	0.465	11/01/03	34.090
5 Northwest Natural Gas	0.315	0.315	0.315	0.315	11/15/03	27.870
6 NSTAR	0.530	0.540	0.540	0.540	11/01/03	44.250
7 Piedmont Natural Gas	0.400	0.400	0.415	0.415	10/15/03	37.560
8 WGL Holdings Inc	0.318	0.318	0.320	0.320	11/01/03	26.100

Consumers Illinois Water Company

Expected Quarterly Dividends

Water Sample

Company	D _{1,1}	D _{1,2}	D _{1,3}	D _{1,4}
American States Water	\$0.228	\$0.228	\$0.228	\$0.228
Artesian Resources	0.198	0.214	0.214	0.214
California Water Services	0.281	0.290	0.290	0.290
Middlesex Water	0.215	0.230	0.230	0.230
Philadelphia Suburban Corp.	0.140	0.150	0.150	0.150
Southwest Water	0.058	0.058	0.058	0.063
York Water Co.	0.135	0.144	0.144	0.144

Utility Sample

Company	D _{1,1}	D _{1,2}	D _{1,3}	D _{1,4}
AGL Resources	\$0.280	\$0.280	\$0.280	\$0.296
Consolidated Edison	0.560	0.577	0.577	0.577
Laclede Group	0.335	0.335	0.335	0.335
Nicor Inc	0.465	0.465	0.488	0.488
Northwest Natural Gas	0.330	0.330	0.330	0.330
NSTAR	0.540	0.567	0.567	0.567
Piedmont Natural Gas	0.415	0.415	0.436	0.436
WGL Holdings Inc	0.320	0.320	0.333	0.333

Consumers Illinois Water Company

DCF- Cost of Common Equity Estimate

Water Sample

	<u>Company</u>	<u>Cost of Equity Estimate</u>
1	American States Water	6.91%
2	Artesian Resources	11.49%
3	California Water Services	7.58%
4	Middlesex Water	10.79%
5	Philadelphia Suburban Corp.	11.30%
6	Southwest Water	9.83%
7	York Water Co.	10.25%
	Average	<u><u>9.74%</u></u>

Utility Sample

	<u>Company</u>	<u>Cost of Equity Estimate</u>
1	AGL Resources	10.11%
2	Consolidated Edison	8.91%
3	Laclede Group	9.44%
4	Nicor Inc	10.66%
5	Northwest Natural Gas	9.50%
6	NSTAR	10.32%
7	Piedmont Natural Gas	9.72%
8	WGL Holdings Inc	9.33%
	Average	<u><u>9.75%</u></u>

Consumers Illinois Water Company

Risk Premium Analysis

Interest Rates as of August 11, 2003

U.S. Treasury Bills		U.S. Treasury Bonds	
Discount Rate	Effective Yield	Bond Equivalent Yield	Effective Yield
0.94%	0.96%	5.43%	5.50%

Risk Premium Cost of Equity Estimates*

Water Sample

Risk-Free Rate		Beta		Risk Premium		Cost of Common Equity
5.50%	+	0.500	*	(13.66% - 5.50%)	=	9.58%

Utility Sample

Risk-Free Rate		Beta		Risk Premium		Cost of Common Equity
5.50%	+	0.595	*	(13.66% - 5.50%)	=	10.36%

*Risk-Free Rate Proxy is the U.S. Treasury Bond

Consumers Illinois Water Company

Analysis of Ahern's Growth Rates

Central Tendency	Company	Weight			Composite
		Range of Growth Rates 25.0%	Average of all Growth Rates 25.0%	Average of Projected EPS Growth Rates 50.0%	
Water Sample					
VL Historical DPS		0.0%	14.3%		3.6%
American State Water	14.3%	0.0%	2.0%	0.0%	0.5%
Artesian Resources	14.3%	0.0%	2.0%	0.0%	0.5%
California Water Service	14.3%	0.0%	2.0%	0.0%	0.5%
Middlesex Water Company	14.3%	0.0%	2.0%	0.0%	0.5%
Philadelphia Suburban	14.3%	0.0%	2.0%	0.0%	0.5%
Southwest Water	14.3%	0.0%	2.0%	0.0%	0.5%
York Water	14.3%	0.0%	2.0%	0.0%	0.5%
VL Historical EPS		0.0%	14.3%		3.6%
American State Water	25.0%	0.0%	3.6%	0.0%	0.9%
Artesian Resources	25.0%	0.0%	3.6%	0.0%	0.9%
California Water Service	0.0%	0.0%	0.0%	0.0%	0.0%
Middlesex Water Company	0.0%	0.0%	0.0%	0.0%	0.0%
Philadelphia Suburban	25.0%	0.0%	3.6%	0.0%	0.9%
Southwest Water	0.0%	0.0%	0.0%	0.0%	0.0%
York Water	25.0%	0.0%	3.6%	0.0%	0.9%
Historical BR+VS		0.0%	14.3%		3.6%
American State Water	14.3%	0.0%	2.0%	0.0%	0.5%
Artesian Resources	14.3%	0.0%	2.0%	0.0%	0.5%
California Water Service	14.3%	0.0%	2.0%	0.0%	0.5%
Middlesex Water Company	14.3%	0.0%	2.0%	0.0%	0.5%
Philadelphia Suburban	14.3%	0.0%	2.0%	0.0%	0.5%
Southwest Water	14.3%	0.0%	2.0%	0.0%	0.5%
York Water	14.3%	0.0%	2.0%	0.0%	0.5%
VL Projected DPS		50.0%	14.3%		16.1%
American State Water	33.3%	16.7%	4.8%	0.0%	5.4%
Artesian Resources	0.0%	0.0%	0.0%	0.0%	0.0%
California Water Service	33.3%	16.7%	4.8%	0.0%	5.4%
Middlesex Water Company	0.0%	0.0%	0.0%	0.0%	0.0%
Philadelphia Suburban	33.3%	16.7%	4.8%	0.0%	5.4%
Southwest Water	0.0%	0.0%	0.0%	0.0%	0.0%
York Water	0.0%	0.0%	0.0%	0.0%	0.0%

		Weight				
Central Tendency	Company	Range of Growth Rates 25.0%	Average of all Growth Rates 25.0%	Average of Projected EPS Growth Rates 50.0%	Composite 100.0%	
VL Projected EPS		50.0%	14.3%	50.0%	41.1%	
	American State Water	33.3%	16.7%	4.8%	16.7%	13.7%
	Artesian Resources	0.0%	0.0%	0.0%	0.0%	0.0%
	California Water Service	33.3%	16.7%	4.8%	16.7%	13.7%
	Middlesex Water Company	0.0%	0.0%	0.0%	0.0%	0.0%
	Philadelphia Suburban	33.3%	16.7%	4.8%	16.7%	13.7%
	Southwest Water	0.0%	0.0%	0.0%	0.0%	0.0%
	York Water	0.0%	0.0%	0.0%	0.0%	0.0%
Thompson/First Call		0.0%	14.3%	50.0%	28.6%	
	American State Water	14.3%	0.0%	2.0%	7.1%	4.1%
	Artesian Resources	14.3%	0.0%	2.0%	7.1%	4.1%
	California Water Service	14.3%	0.0%	2.0%	7.1%	4.1%
	Middlesex Water Company	14.3%	0.0%	2.0%	7.1%	4.1%
	Philadelphia Suburban	14.3%	0.0%	2.0%	7.1%	4.1%
	Southwest Water	14.3%	0.0%	2.0%	7.1%	4.1%
	York Water	14.3%	0.0%	2.0%	7.1%	4.1%
Projected BR+VS		0.0%	14.3%		3.6%	
	American State Water	33.3%	0.0%	4.8%	0.0%	1.2%
	Artesian Resources	0.0%	0.0%	0.0%	0.0%	0.0%
	California Water Service	33.3%	0.0%	4.8%	0.0%	1.2%
	Middlesex Water Company	0.0%	0.0%	0.0%	0.0%	0.0%
	Philadelphia Suburban	33.3%	0.0%	4.8%	0.0%	1.2%
	Southwest Water	0.0%	0.0%	0.0%	0.0%	0.0%
	York Water	0.0%	0.0%	0.0%	0.0%	0.0%
All Methods						
	American State Water					26.2%
	Artesian Resources					6.0%
	California Water Service					25.3%
	Middlesex Water Company					5.1%
	Philadelphia Suburban					26.2%
	Southwest Water					5.1%
	York Water					6.0%

Attachment A

STANDARD & POOR'S	RATINGS DIRECT

Research:

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Pennsylvania Suburban Water Co

Publication date: 23-Sep-2003

Credit Analyst: Dimitri Nikas, New York (1) 212-438-7807; Kevin Beicke, New York (1) 212-438-7847

Corporate Credit Rating

A+/Stable/--

Business Profile

1 2 **3** 4 5 6 7 8 9 10

Financial policy:

Conservative

Debt maturities:

As of Dec. 31, 2002:

2003: \$33.1 million

2004: \$39.2 million

2005: \$40.2 million

2006: \$15.1 million

2007: \$14.2 million

Thereafter: \$340.3 million

Bank lines:

Pennsylvania Suburban has a \$70 million, 364-day revolving credit facility with four banks. As of June 30, 2003, \$19 million was available.

Outstanding Rating(s)

Pennsylvania Suburban Water Co

Sr secd debt

Local currency

AA-

Corporate Credit Rating History

Jan. 2, 2002

A+

Company Contact

Ms. Kathy L. Pape, VP, Treasurer and Rate Counsel (1) 610-645-1142

Major Rating Factors

Strengths:

- Supportive regulatory environment.
- Strong service territory with a diverse economy and above-average demographics.
- Above-average operations with a highly interconnected system and adequate water supplies that meet all Safe Drinking Water Act (SDWA) standards.
- Strong competitive position.
- Geographic and regulatory diversity at the parent level.
- A focused management team with no intention of entering nonregulated, riskier ventures.
- A disciplined acquisition strategy.

Weaknesses:

- Debt leverage that is slightly above the targets for an 'A+' rating.
- Reliance on acquisitions to increase the business because organic growth is inherently below 1%.
- Competition for growth from other investor-owned water utilities in Pennsylvania and in the U.S.

■ Rationale

The ratings on Pennsylvania Suburban reflect the consolidated credit quality of the parent, Philadelphia Suburban Corp. (PSC), because Pennsylvania Suburban is a core entity for PSC. If PSC's credit quality deteriorates so as to be significantly weaker than that of Pennsylvania Suburban, a ratings downgrade for Pennsylvania Suburban could occur.

The ratings on Pennsylvania Suburban further reflect the company's strong business position, which is characterized by a supportive regulatory environment, an above-average service territory, ample, quality water supplies, and efficient operations. Philadelphia Suburban has a financial profile that is currently adequate for the rating category, combined with a disciplined management team that focuses on growth through acquisitions.

Bryn Mawr, Pa.-based Pennsylvania Suburban had \$527 million of debt outstanding as of June 30, 2003.

PSC recently completed the purchase of AquaSource Utility Inc., a subsidiary of DQE Inc. (BBB/Negative/A-2) for \$195 million. The rating action reflects the fact that this acquisition slightly improved the consolidated business profile and did not weaken the consolidated financial profile. The transaction was financed with \$105 million of long-term debt and \$90 million of equity.

The AquaSource acquisition expanded regulated utility operations in Texas, Florida, Indiana, and Virginia and added 130,000 customers, with an additional 40,000 customers through select integrated contract operations. Pennsylvania Suburban is the largest operating subsidiary of PSC, contributing about 70% of revenues and 72% of assets as of June 30, 2003.

Pennsylvania Suburban serves more than 355,600 customers in the northern and western suburbs of Philadelphia, as well as 57,800 customers in other parts of Pennsylvania. Residential and commercial customers account for 85% of revenues and 86% of sales, which provide for a stable customer base with predictable usage patterns and low market risk. The service territory has favorable demographics and a diverse economic base, which should withstand the economic cycles.

Water is supplied primarily from surface sources (75%), with the balance coming from wells (14%) and purchases (11%). All production meets or exceeds current SDWA standards. Future regulations currently under review should not have a material effect on the company. Pennsylvania Suburban's primary water system is about 95% interconnected and small acquisitions are rapidly integrated into the main water system. This rapid integration provides opportunities for considerable efficiency and cost reduction.

Standard & Poor's views the regulatory environment in Pennsylvania as supportive of credit quality, because water utilities can use a future test year during rate cases, have an incentive to rehabilitate aging infrastructure through the Distribution System Improvement Charge (DSIC) mechanism, and can recover the acquisition premium for certain troubled systems of up to 3,300 users, which provides an incentive for small water system consolidation in the state.

Pennsylvania Suburban has a financial profile that is currently satisfactory for the rating category. For the 12 months ended June 30, 2003, net cash flow was more than \$52 million. Funds from operations (FFO) interest coverage was 4.2x, while FFO to average total debt was 20%. Debt leverage was 54%, which is reasonable for the rating. Financial flexibility is adequate, with manageable debt maturities expected over the next few years.

Liquidity.

The liquidity position for Pennsylvania Suburban is considered adequate for the rating. As of June 30, 2003, the company had \$4 million in cash and cash equivalents. Pennsylvania Suburban has a \$70 million revolving credit facility with \$19 million available as of June 30, 2003. Near-term debt maturities are manageable, with a total of \$33 million of long-term debt maturing in 2003.

■ Outlook

The stable outlook reflects Standard & Poor's expectations that Pennsylvania Suburban will continue to

fund acquisitions in a manner that will not adversely affect the financial profile. The stable outlook also reflects the expectation that the consolidated financial profile will continue to support the current rating.

■ Rating Methodology

The ratings on Pennsylvania Suburban reflect the strength of the consolidated business and financial profiles of the unrated parent, PSC. Standard & Poor's assumes that at the current rating level, there is no meaningful regulatory insulation between Pennsylvania Suburban and PSC. As a result, the credit quality of Pennsylvania Suburban is also determined in conjunction with the credit quality of the parent. If PSC's business and financial profiles deteriorate so as to be significantly weaker than those of Pennsylvania Suburban, a ratings downgrade for Pennsylvania Suburban could occur.

The senior secured debt is rated one notch above the corporate credit rating, which reflects Standard & Poor's belief that these bonds are collateralized by utility property, whose value exceeds the maximum amount of mortgage bonds that could be outstanding under the terms of the indenture. Therefore, Standard & Poor's has a higher degree of confidence that first mortgage bondholders would recover, albeit delayed, their principal in a bankruptcy scenario.

■ Business Description

Pennsylvania Suburban is a subsidiary of PSC. After PSC's recent acquisition of AquaSource Utility Inc., Pennsylvania Suburban now accounts for more than 413,000 of PSC's 802,000 total customers and about 70% of PSC's total revenues through the first half of 2003. For the 12 months ended Dec. 31, 2002, the operating revenues associated with wastewater services were less than 3% of total consolidated revenues, not materially affecting credit quality. Vivendi Environnement S.A., which formerly owned 16.8% of PSC's common stock, completely monetized its PSC investment during 2002. As of Dec. 31, 2002, no single shareholder owned more than 3% of PSC's outstanding common shares.

■ Business Profile

Pennsylvania Suburban operates under the regulatory jurisdiction of the Pennsylvania Public Utility Commission. Standard & Poor's views the regulatory environment as supportive of credit quality because it provides for innovative cost recovery mechanisms such as a DSIC that offers water utilities the incentive to rehabilitate aging infrastructure; a future test year during rate case filings; a consolidated rate structure which allows capital expenditures to be spread across a wide customer base; and recovery of the acquisition premium for certain troubled systems of up to 3,300 customers. PSC enjoys regulatory diversity with operations in Pennsylvania, Illinois, New Jersey, Maine, Ohio, and North Carolina.

The service territory is located throughout the northern and western suburbs of Philadelphia, as well as other parts of Pennsylvania, and has very favorable demographic characteristics. Residential and commercial customers account for 97% of the total customer base and 85% of revenues, providing for relatively stable and predictable usage patterns, and resulting in cash flow stability. Pennsylvania Suburban procures the bulk of water from surface sources (75%), with the balance coming from 69 wells (14%) and purchases (11%). All production meets existing SDWA standards and is below the maximum allowed contaminant levels for all substances currently regulated. In addition, Pennsylvania Suburban does not expect upcoming SDWA regulations over the next five years to have a material effect on the company's cost structure. Over 95% of total Pennsylvania Suburban customers are serviced by a fully interconnected system, which allows the company to achieve economies of scale. Unaccounted-for water in 2002 was high at about 18% due to previous acquisitions of certain less-efficient systems, but this figure is expected to trend downward once these systems are updated.

The competitive position is above average, partly aided by a natural monopoly in service area, and high barriers to entry. Customer service is very good and rates are reasonable, mitigating municipalization concerns. Competition, however, may arise from other companies for various acquisitions in Pennsylvania and for certain customers who have alternate water providers.

■ Financial Profile

Financial Policy: Conservative

The company's financial policy is conservative and is characterized by prudent acquisitions which typically are at or below the "book" value of the acquired municipal systems; a dividend payout ratio that has been trending down, which reflects modest dividend increases; and the judicious use of tax-exempt financing and low-interest bearing securities, where possible. Pennsylvania Suburban

targets an equity layer of between 45% to 50% and the parent regularly issues common stock to ensure that level of equity at the subsidiary.

Profitability and cash flow.

Profitability benefits from regular rate increases, which account for the addition of infrastructure and acquisitions, and careful cost-control efforts. As a result, Pennsylvania Suburban should earn its combined allowed ROE of 10.7%. Pretax interest coverage is strong for the rating category and should continue to exceed 3.5x for the intermediate term.

Cash flow protection measures are sound for the rating category, benefiting from a good cost structure, regular rate increases, and judicious use of debt. As a result, FFO interest coverage should exceed 4x and FFO to average total debt should be around 20% for the intermediate term.

Capital structure and financial flexibility.

Management at Pennsylvania Suburban aspires to maintain a balanced capital structure with total debt to total capital ranging from 50% to 55%, depending on the available acquisitions that must be debt financed. On a regular basis, the parent will infuse equity to maintain the stated capital structure.

Financial flexibility is adequate for the rating category, with moderate maintenance capital spending, a declining dividend payout ratio, and manageable debt maturities for the next three to four years.

Table 1 Pennsylvania Suburban Water Co. -- Competitors				
Industry Sector: Regulated Transmission & Distribution - Water				
	--Average of past three fiscal years--			
	Pennsylvania Suburban Water Co.	American Water	Baton Rouge Water Works Co. (The)	Middlesex Water Co.
Rating	A+/Stable/--	N.R.	AA/Stable/--	A/Negative/--
(Mil. \$)				
Sales	199.3	1,501.6	35.8	58.7
Net income from cont. oper.	41.9	341.7	6.6	11.8
Funds from oper. (FFO)	72.7	155.6	12.6	6.7
Capital expenditures	90.9	392.5	8.9	14.3
Total debt	444.4	3,346.1	37.1	98.5
Preferred stock	0.0	45.3	1.3	2.7
Common equity	366.8	1,743.2	57.8	73.1
Total capital	811.2	5,134.6	96.2	174.4
Ratios				
Adj. EBIT interest coverage (x)	3.5	2.1	4.9	3.0
Adj. FFO interest coverage (x)	3.6	2.7	5.4	3.3
Adj. FFO/avg. total debt (%)	17.6	10.9	35.2	12.5
NCF/capex (%)	56.6	71.3	92.4	52.5
Adj. total debt/capital (%)	54.8	65.4	38.6	56.1
Return on common equity (%)	12.2	8.3	11.5	8.7
Common dividend payout (%)	50.8	65.7	64.4	97.9
N.R. -- Not rated. NCF -- Net cash flow.				

Table 2 Pennsylvania Suburban Water Co. -- Financial Summary
Industry Sector: Regulated Transmission & Distribution - Water

	--Fiscal year ended Dec. 31--				
Rating history	A+/Watch Neg/--	A+/Stable/--	A+/Stable/--	A+/Stable/--	A+/Watch Neg/--
	2002	2001	2000	1999	1998
(Mil. \$)					
Sales	221.2	210.6	166.0	151.0	147.6
Net income from cont. oper.	47.4	46.3	31.9	29.8	29.1
Funds from oper. (FFO)	88.4	73.0	56.7	54.1	49.7
Capital expenditures	97.3	94.7	80.7	61.7	58.2
Total debt	518.3	466.3	348.7	334.7	264.3
Preferred stock	0.0	0.0	0.0	0.0	0.0
Common equity	434.0	372.6	293.8	253.3	239.5
Total capital	952.3	838.9	642.5	588.0	503.8
Ratios					
Adj. EBIT interest coverage (x)	3.6	3.6	3.1	3.4	3.6
Adj. FFO interest coverage (x)	3.9	3.5	3.2	3.6	3.6
Adj. FFO/avg. total debt (%)	18.0	17.9	16.6	18.1	18.8
NCF/capex (%)	62.5	56.6	49.4	61.1	57.0
Adj. total debt/capital (%)	54.4	55.6	54.3	56.9	52.5
Return on common equity (%)	11.5	13.7	11.4	11.9	11.8
Common dividend payout (%)	58.2	41.9	52.7	55.0	56.6
NCF -- Net cash flow.					